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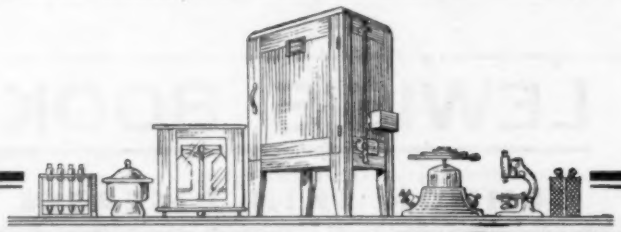

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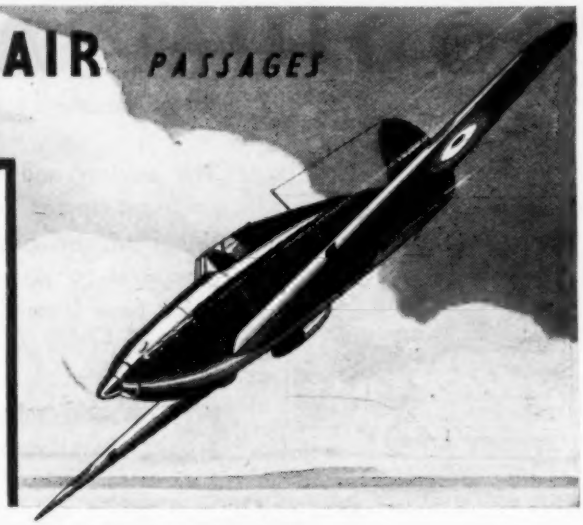

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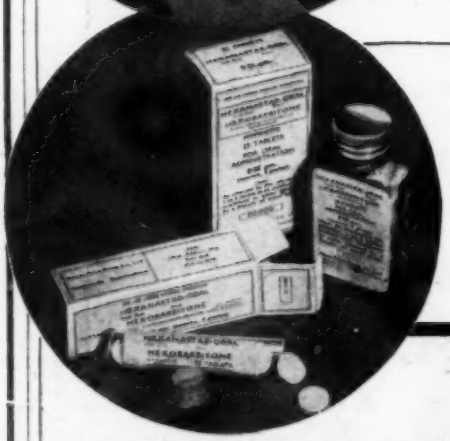

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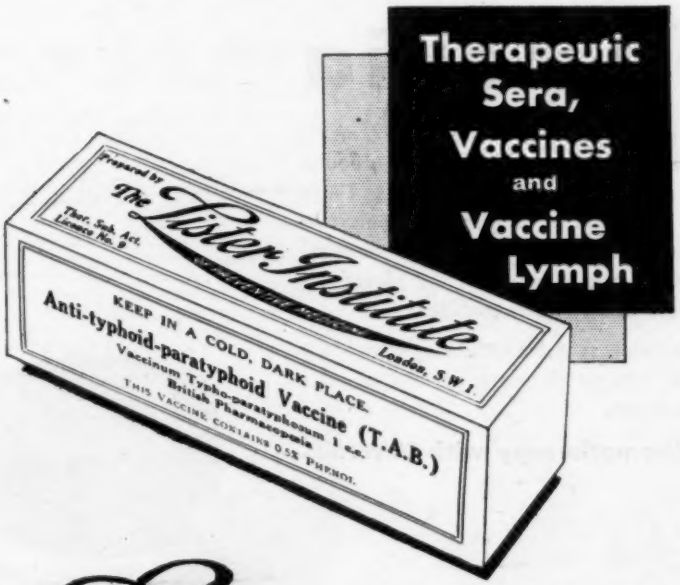

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ORIGINAL ARTICLES

VITAL STATISTICS OF THE SECOND YEAR OF THE WAR

PERCY STOCKS, M.D. CAMB., D.P.H.
MEDICAL STATISTICAL OFFICER, GENERAL REGISTER OFFICE

THE publication of the Registrar-General's Quarterly Return for the third quarter of 1941 makes it possible to examine the trend of birth- and death-rates in England and Wales during the first two years of the war. Although there have been extensive movements of population during the war, and progressive changes in its age-constitution, the average total population has not changed sufficiently to invalidate the provisional use of the mid-1939 estimate as basis for the war-time rates. The National Register of 1939 was taken into account in calculating the mid-year estimate. All local rates in war-time must necessarily be based on civilian populations and deaths of civilians, but for national rates we can choose between civilian and total rates, the latter being confined of course to deaths registered in England and Wales and based on the estimated average number of persons, whether civilians or not, actually living in the country at a given moment. A civilian death-rate tells us what proportion died amongst a residual population from which a large section of the healthy young adults had been taken away; during a war it must be expected to rise as more and more of these young people of low death expectation are transferred to the Services, and consequently it is difficult to evaluate the health significance of the trend of such an index. The total death-rate suffers to a much slighter extent, if indeed it suffers at all, from this disadvantage, since the healthy young persons removed from its scope are limited to the migratory balance of losses over gains in this section of the population compared with the position in times of peace. In the present war there have been compensatory movements of such kind and extent that this source of error has not yet been considerable. Provided, therefore, that allowance can be made for deaths due to violent causes, the total death-rates as given in the Quarterly Returns of 1941 together with the infant-mortality rates furnish a tolerably good index of the health position in general.

The Quarterly Returns for each quarter of 1941 have contained a new table giving for each sex separately the total deaths registered in successive quarters since 1938 from 36 different causes selected as being of special interest in time of war. The return for the third quarter of 1941 gives these in each quarter from 1939 to mid-1941, and corresponding figures for each quarter of 1938 were given in the return for the first quarter of 1941. From the beginning of 1940 two important changes were made in the classification of deaths by cause—(1) the new International List of Causes of Death, as revised in 1938 by a conference at Paris, was substituted for the previous revision which was in force during 1931–39; and (2) the new system of selection where more than one cause is mentioned on the death certificate came into force, this being now based on the order of preference stated by the physician rather than on fixed rules of precedence.[1] In the appendix table of separate causes now being published in the Quarterly Returns the deaths in 1938 and 1939 have been corrected for the effect of both these changes, and represent the numbers which would have been classified to the cause in question under the present system. Bearing this in mind, and the fact that the change in total population since 1938 has been slight, the deaths as they stand provide a sufficiently accurate index of the war-time trend of the 36 causes, without need for any statistical manipulations or corrections other than a slight allowance in the case of certain diseases for the progressive change in age constitution of the population. It is hoped that this record may be continued quarter by quarter, with substitution, if and when the need arises, of other causes of special current interest for those of lesser importance.

Since the Quarterly Returns are not easily accessible to many doctors who are interested in the war-time behaviour of particular diseases or of the national death-rates generally, it was thought that a summary of the main facts would be helpful in removing some misconceptions and in calling attention to the danger points in the health position. For fuller details reference can be made to the Quarterly Returns for 1941.

LIVE AND STILLBIRTHS

Quarter	Total births, live and still (hundreds registered)				Stillbirths per 1000 of total		
	1938	1939	1940	1941	1939	1940	1941
1st	1614	1597	1606	1526	39	39	37
2nd	1708	1707	1727	1527	37	35	36
3rd	1642	1670	1545	1524	36	35	33
4th	1496	1463	1420	..	39	36	..
	Live birth-rates per 1000 population				Per cent. change in livebirths compared with 1939		
	1938	1939	1940*	1941*	1940	1941	
1st	15·3	15·0	15·0	14·4	+ 0·6	− 4·1	
2nd	16·0	15·9	16·2	14·2	+ 1·4	− 10·4	
3rd	15·2	15·4	14·3	14·1	− 7·4	− 8·5	
4th	13·8	13·5	13·1	..	− 2·7	..	

The third quarter of 1940 recorded a sudden drop in the birth-rate, indicative of a fall in conceptions during the first few months of the war or alternatively an increase in abortions of which we have no evidence. In the next two quarters the loss of births was less pronounced but in the second quarter of 1941 it exceeded 10% and in the third quarter amounted to 8¼%. A considerable fall in the number of conceptions probably occurred, therefore, in that period of 1940 when the country was faced with grave danger, notwithstanding the return of large numbers of men from abroad at that time. A rise in abortion deaths in the first half of 1941 suggests, however, that an unduly large proportion of conceptions may be terminating in abortion. The risk of stillbirth has declined during the war, an unexpected happening linked also with the improving rate of maternal mortality.

DEATH-RATES AND INFANT MORTALITY

Quarter	Infant-mortality rates per 1000 live births				Death-rates per 1000 living (all causes)			
	1938	1939	1940	1941	1938	1939	1940*	1941*
1st	68	65	77	75	13·6	15·1	19·9	17·5
2nd	49	48	46	59	11·6	11·7	11·6	13·5
3rd	42	40	43	43	9·9	9·9	10·7	9·7
4th	52	48	57	..	11·5	11·6	13·9	..

* Provisional rates based on mid-1939 population.

The deduction of casualties directly caused by operations of war would not affect the infant-mortality rates in the table up to the middle of 1940; in the third and fourth quarters of 1940 and first and second quarters of 1941 the rates would be reduced by 1 unit in each instance; the rate for the third quarter of 1941 would be unchanged. Comparing with the four quarters immediately preceding the war, the war-time change in infant mortality not directly due to aerial bombardment was, therefore, in the first four quarters of the war − 4, + 12, − 2, + 2, and in the next four quarters + 4, + 9, + 10, + 3; that is to say, in the first four quarters there was an average rise of 2 and in the second four quarters an average rise of 6¼ in the rate per 1000 live births.

From the health standpoint the death-rates from all causes in time of war are, by themselves, of limited value as indices, and the rates from all non-violent causes, given below, provide a better indication of the war-time trend of fatal disease.

1. See Manual of the International List of Causes of Death as adapted for use in England and Wales and Northern Ireland, 1940, pp. 36-41.

DEATH-RATES FROM ALL CAUSES OTHER THAN VIOLENCE †

Quarter	Per 1000 living					
	1936	1937	1938	1939	1940*	1941*
1st	14·6	15·6	13·0	14·5	19·2	15·9
2nd	11·2	11·0	11·1	11·1	11·0	11·6
3rd	9·2	9·1	9·4	9·3	9·3	8·9
4th	11·4	11·8	10·9	11·0	11·5	..

* Provisional rates based on mid-1939 population.
† Suicide, homicide, accidental causes including poisoning, operations of war.

The rates for the first quarters of 1940 and 1941 were influenced by the severe winters, aggravated no doubt by war conditions, which hastened the death of many old people and persons suffering from chronic ailments. The second quarter has for many years shown a remarkably steady rate, about 11 per 1000, but some increase in this rate occurred in 1941 which was distributed over a wide range of chronic diseases and was probably due to the effect of war strain in turning the scale between recovery and death for a certain proportion of sick persons. No important rise has occurred in the rates for the third and fourth quarters; indeed the all-causes rate for the third quarter of 1941 was unusually low, this being a period in which the war tempo was considerably relieved in this country.

TUBERCULOSIS

Quarter	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
RESPIRATORY TUBERCULOSIS DEATHS						
3rd	2662	2542	2665	2032	1934	2062
4th	2991	3091	3328	2163	2118	2283
1st	3780	4533	4226	2539	2974	2789
2nd	3291	3394	3849	2249	2421	2640
Total	12724	13560	14068	8983	9447	9774
DEATHS FROM OTHER FORMS OF TUBERCULOSIS						
3rd	503	492	539	456	426	496
4th	481	476	531	453	414	461
1st	625	596	731	492	552	606
2nd	635	715	778	520	594	758
Total	2244	2279	2579	1921	1986	2321

The figures for respiratory tuberculosis speak for themselves, and no amount of selective treatment of them, as in a *Times* leading article of Dec. 29 last, can obscure the fact that a real increase in deaths from respiratory tuberculosis has occurred since the war began. Comparing with the year from mid-1938 to mid-1939 as standard, the increase amounted to about 6% in the first year of war and 10% in the second year. For other forms of tuberculosis the increase was later in appearing but was then proportionately greater than for the respiratory form.

Again comparing with the year preceding mid-1939, the increase in deaths from other forms of tuberculosis amounted to 2·4% in the first year and 17·6% in the second year. The bulk of the recent increase has been due to tuberculous meningitis; in the first half of 1940 deaths from this cause numbered 1047 but in the first half of 1941 the total was 1422, an increase of 375, while all other forms of non-respiratory tuberculosis showed a rise of only 41. Deaths from tuberculous meningitis of children under 10 years numbered 1001 in the whole of 1939, but in the first three-quarters of 1941 alone they numbered 1233.

DEATHS FROM CEREBROSPINAL FEVER

Quarter	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
3rd	68	49	199	46	23	122
4th	61	76	269	30	41	168
1st	96	649	479	80	501	412
2nd	82	388	356	70	288	278

The deaths in the first half of 1941 were 84%, and the notifications 85%, of the totals reached in the first half of 1940. Fatality, as indicated by deaths per 100 notifications, was 38% in the first half of 1939; for civilians it was 32, 22, 23, 21% in the four half-years which followed, and for non-civilians 21, 8, 8, 9%.

OTHER INFECTIONS AND METABOLIC DISORDERS

—	Half-year	Deaths (both sexes) at all ages		
		1938–39	1939–40	1940–41
Diphtheria	July–Dec.	1238	990	1485
	Jan.–June	1142	995	1476
Whooping-cough	July–Dec.	336	385	396
	Jan.–June	844	282	1555
Measles	July–Dec.	140	117	565
	Jan.–June	186	292	1042
Acute poliomyelitis and polioencephalitis	July–Dec.	210	88	102
	Jan.–June	55	59	66
Scarlet fever	July–Dec.	112	81	71
	Jan.–June	100	83	76
Erysipelas	July–Dec.	114	79	92
	Jan.–June	169	122	126
Ear and mastoid disease	July–Dec.	531	475	472
	Jan.–June	714	537	492
Appendicitis	July–Dec.	1453	1344	1132
	Jan.–June	1392	1333	1033
Influenza	July–Dec.	1196	971	984
	Jan.–June	7050	10498	6003
Pneumonia	July–Dec.	9349	7480	9414
	Jan.–June	15924	19781	17890
Bronchitis	July–Dec.	9578	10107	11429
	Jan.–June	21331	34852	25211
Rheumatic fever (acute)	July–Dec.	457	414	341
	Jan.–June	541	510	367
Diabetes mellitus	July–Dec.	2258	2409	2343
	Jan.–June	2752	3009	2775
Exophthalmic goitre	July–Dec.	661	650	477
	Jan.–June	730	709	527
Pernicious anæmia	July–Dec.	885	917	945
	Jan.–June	1005	1222	1354

Of the infectious diseases of childhood, diphtheria deaths increased considerably in the year commencing at mid-1940, as did whooping-cough deaths. Measles also became epidemic again in many towns where this had been expected a year earlier. The streptococcal and pyogenic infections have declined remarkably as causes of death during the war, despite less satisfactory conditions, a result probably due to sulphonamide therapy. Pneumonia has failed to register any improvement despite the new therapy. Bronchitis and pneumonia seem, however, to have been adversely affected to some extent by the conditions imposed by air-raids, and this has probably counteracted the beneficial effects which might otherwise have been seen in the statistics. There has been a remarkable decline in deaths from rheumatic fever, although, as might have been expected, deaths from its late sequelæ have increased during the war. Diabetes shows little change in the two years, nor in comparison with the years 1937 and 1938, when the annual deaths according to the new method of classification were 5106 and 4732 respectively. Exophthalmic goitre deaths declined greatly in the second year of the war, but those from pernicious anæmia have increased.

DEATHS FROM ULCER OF THE STOMACH AND DUODENUM

Half-year	Males			Females		
	1938–39	1939–40	1940–41	1938–39	1939–40	1940–41
July–Dec.	1814	1886	2262	500	526	654
Jan.–June	2047	2263	2695	590	645	676

Deaths from peptic ulcer have increased considerably during the war, the increase in the second year being 28% for men and 22% for women.

MATERNAL DEATHS, INJURY AT BIRTH, PREMATURITY

—	Half-year	Deaths 1938–39	1939–40	1940–41
Diseases of pregnancy and childbirth (except abortion)	July–Dec.	824	815	635
	Jan.–June	828	736	694
Injury at birth (infants under 1 yr.)	July–Dec.	824	799	720
	Jan.–June	871	900	748
Prematurity (infants under 1 yr.)	July–Dec.	4204	4144	3775
	Jan.–June	5035	4823	4561

Remembering that live births were about 6½% less in the second twelve months of the war, the deaths of infants from injury at birth fell by 13% and from prematurity by 10%, while maternal deaths declined by 20%, a noteworthy improvement.

OTHER NON-VIOLENT CAUSES OF DEATH

Among other causes of death, the following have shown noteworthy increases since the beginning of the war: paratyphoid fever, dysentery, diarrhœa and enteritis, schizophrenia, epilepsy, pleurisy, hernia, congenital hydrocephalus and pyloric stenosis (males), cancer of various sites, diseases of the prostate and rheumatoid arthritis (males). Suicides have declined, especially among women, the 1938–39, 1939–40 and 1940–41 totals being 3449, 3209, 3194 for males, and 1730, 1674, 1463 for females.

THE USE OF PLASMA IN A HOSPITAL SHIP

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THE administration of plasma and blood in ships presents difficulties which may lead to undue reliance being placed on morphia and intravenous saline for the treatment of shock. The essentially transient benefit of intravenous saline has been stressed by Hill, McMichael and Sharpey-Schafer (1940). The following is an account of the administration of plasma to 16 severely burnt patients in a hospital ship operating in the Middle East, and as a result of this experience we offer suggestions for its more widespread use at sea.

Many of the casualties during an action will be due to burns, and if these can be treated for shock during transport to base lives should be saved. Best and Solandt (1940) have shown that plasma and serum are physiologically and therapeutically identical, and the experiments of Buttle, Kekwick and Schweitzer (1940) and of Levinson, Neuwelt and Necheles (1940) bear testimony to the efficiency of plasma and serum as a blood substitute in acute hæmorrhage in the cat and dog. Satisfactory results from plasma infusion have been reported by Brennan (1940) in cases of acute hæmorrhage in man, and by Edwards, Kay and Davie (1940) in wound shock. For these reasons, and because it is easy to give, plasma commends itself for use in ships; but the preparation which is best employed needs careful consideration. We prefer dilute citrated plasma, the value of which is well established. It can be easily prepared and supplied in one container ready after simple filtration to enter the patient. Experience will probably prove that it can be stored at room temperature; meanwhile we consider refrigeration, especially in tropical and subtropical climates, desirable. Such facilities are always available in ships, and we have insisted on storage at 0°–4° C. and recommended freezing solid if possible.

PREPARATION OF THE PLASMA

The plasma was harvested from pooled blood collected into isotonic sodium citrate saline (Maizels and Whittaker 1940) in the proportion of 1500 c.cm. of blood to 500 c.cm. of diluent. Sulphanilamide was added to give a final concentration of 1 in 1000. After standing at 1°–4° C. the plasma was harvested as early as was compatible with a reasonable yield (usually in 4–5 days). Fat in the plasma was avoided by using fasting donors, and blood for Kahn test was taken from each. The first donors were chosen from groups A and B in an endeavour to produce AB plasma but our supply of these men was soon exhausted and groups A and O now predominate. The separated plasma was stored in 250 c.cm. quantities, in glass bottles sealed with a sterile bung and cover; it was raised to body temperature when required and filtered through sterile gauze before use. Tests for sterility carried out on batch samples after freezing and storage for periods varying from days to months, and on any doubtful sample after thawing, have all been satisfactory.

GENERAL MANAGEMENT OF BURNS

The burns, with one exception, were second degree, and it was their extent or associated injuries which made them serious. Most of the patients were in hospital 14 hours after injury, the others between 12 and 44 hours. Burns treated with one of the jelly preparations, or with tannic acid and flavine, arrived in a better condition than those treated with moist dressings or tannic-acid compresses. The patients were pale, sweating profusely and inclined to be apathetic. The majority had mild local œdema and in one it was very severe. The pulse was rapid and of poor quality, and the respiration-rate increased. Thirst was invariable and its relief provoked retching and vomiting. Spontaneous vomiting was noted twice. The peripheral circulation was poor, and the superficial veins collapsed, dehydration and hæmoconcentration being such that in some patients blood could not be withdrawn through a fine needle from the internal saphenous vein at the ankle. After plasma infusion improvement in the mental condition was notable, apathy giving way to alertness and an increased awareness of pain, often requiring morphia for its relief; the quality of the pulse improved rapidly and thirst was ameliorated. We are in full accord with the procedure proposed by Black (1940) for relating the administration of plasma to the patient's condition. Hæmoglobin estimations can be carried out easily and rapidly, and the amount of plasma required estimated from data which he gives.

All the burns except one third-degree case were treated by the tannic acid, silver nitrate technique (Bettman 1935), which is satisfactory if the skin has not been completely destroyed. We have not seen the circulatory complications of the fingers or damage to the eyes or lids following tanning of the face mentioned by others. Sepsis sometimes developed in skin flexures or at pressure points, but it responded well to cleaning, dehydrating and retanning, or the application of gauze wrung out in 1 in 1000 flavine. Two patients failed to heal within a fortnight. The one third-degree burn was treated during the first week by applying gauze wrung out in spirit which was left undisturbed and later by saline baths and compresses applied over tulle gras. The blood-volume was assessed by repeated hæmoglobin examinations, and the fluid balance from charted intake and output. Of the 16 patients, 4 (cases 1, 2, 4 and 6) required repeated infusions to maintain blood-volume during the first 87 hours in hospital. Charts showed a deficit if fluids were given only by mouth, and routine rectal saline was necessary, but this could as a rule be dispensed with by the third day. Chemotherapy was reserved for established staphylococcal and streptococcal complications. A high protein diet was given to all patients.

Mortality.—There were 7 deaths; 4 patients (cases 5, 8, 9 and 11) were severely burned, showed no response and died within 14 hours of admission. Case 5 had intracranial damage, case 9 had poisoning from nitrous fumes, and the other 2 were much more ill than the degree of hæmoconcentration would indicate. One patient (case 3), extensively burned, responded well to plasma but died 29 hours after admission. He had stood operation well, the burns were covered by a dry firm eschar, the blood-picture was normal, and there were no symptoms of toxæmia. The exact cause of death is not known; (post-mortem examination was often not practicable). Case 1, who was very extensively burned, responded well to plasma but on the fourth postoperative day developed symptoms of burn toxæmia and died 2 days

later of capillary bronchitis. Case 12 developed a severe streptococcal tonsillitis and pharyngitis and died of massive obstructive atelectasis due to capillary bronchitis 8 days after admission.

CASE-HISTORIES

Case-records are arranged in order of degree of hæmoconcentration. We realise the inadequacy of the reports on the patients that died soon after admission but they are included for completeness.

CASE 1.—Admitted May 27, 8 P.M., severely shocked and in a desperate condition, 12 hr. after three-quarters of the body had been burned. At 9.30 P.M., Hb 188%; given 2000 c.cm. plasma. Condition improved, operation then undertaken 4 hr. after admission. May 28, 12.30 A.M., Hb 118%, given 500 c.cm. plasma; 2.30 A.M., given 500 c.cm. plasma; 3 A.M., Hb 104%; 12.25 P.M., Hb 120%, given 600 c.cm. plasma. May 29, 11 A.M., Hb 118%, given 850 c.cm. plasma; 4 P.M., Hb 104%. May 30, Hb 104%. June 1, Hb 90%.

Thus 2000 c.cm. plasma enabled operation to be undertaken. After 4450 c.cm. in all, during 62 hr., the blood-concentration maintained a normal level and there was sustained improvement in the general condition for 36 hr. Symptoms of burn toxæmia then developed and he died 6 days after admission from capillary bronchitis (autopsy). The burns on the back had broken down but elsewhere they were clean and dry.

CASE 2.—Admitted May 27, severely shocked, 14 hr. after half the body had been burned. At 9.30 P.M., Hb 162%, given 1500 c.cm. plasma, mild chill. Condition improved, operation 5 hr. after admission. May 28, 2 A.M., Hb 128%, given 500 c.cm. plasma; 3 A.M., Hb 122%, given 500 c.cm. plasma; 12 noon, Hb 120%, given 600 c.cm. plasma. May 29, 11 A.M., Hb 120%, given 850 c.cm. plasma; 4 P.M., Hb 110%, given 500 c.cm. plasma. May 30, 12.30 P.M., Hb 100%. May 31, 12 noon, Hb 108%, given 1000 c.cm. glucose saline. June 1, Hb 95%. June 4, Hb 94%.

After receiving 4450 c.cm. plasma during 48 hr. and later 1000 c.cm. glucose saline there was steady progress. Discharged after 16 days with wounds healed except the ulnar surface of the forearms and the webs of the fingers.

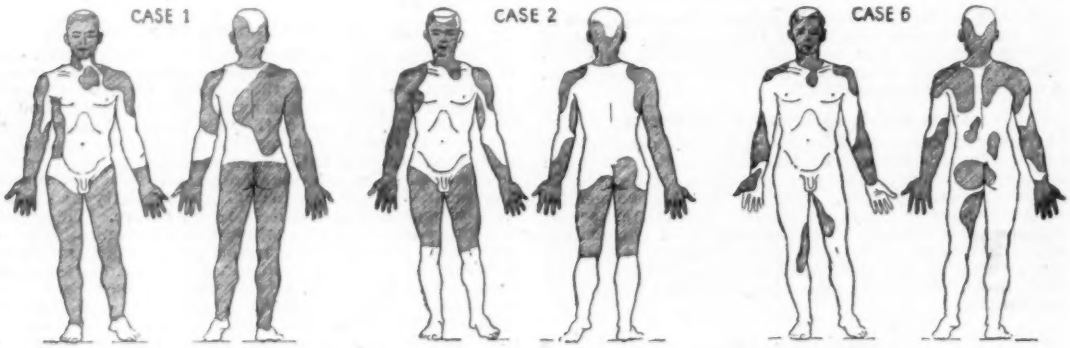
CASE 3.—Severely shocked on admission 14 hr. after burns of face, neck, forearms, hands, and legs between shorts and stockings. Hb 140%, given 1450 c.cm. plasma. Operation 6 hr. after admission. Hb 96% 9 hr. after plasma. Stood operation well but did not rally and died 29 hr. after admission.

CASE 4.—Admitted May 24, with moderate shock, 29 hr. after burns of face, neck, both hands and both legs and having been 1½ hr. in the water. At 1.30 P.M., Hb 122%, given 1000 c.cm. plasma which enabled operation to be undertaken 4 hr. after admission. At 5.30 P.M., Hb 111%, given 500 c.cm. plasma. At 9 P.M., Hb 108%, given 500 c.cm. plasma. May 26, 8.30 A.M., Hb 107%, given 250 c.cm. plasma. During next 9 days Hb readings were normal.

A total of 2250 c.cm. plasma was given during 48 hr. Convalescence was uneventful. The burns healed perfectly. Discharged after 19 days.

CASE 5.—Admitted 44 hr. after injury (had been unconscious for the first 33 hr.). Severely shocked and slightly irrational, splinter wound of right frontal region and burns of face, neck, trunk and limbs. Hb 120%, given 850 c.cm. plasma. Died 6 hr. after admission.

CASE 6.—Admitted May 24, severely shocked and extremely œdematous, 25 hr. after second- and third-degree burns of about half the body and having been 2 hr. in the water. At 1.30 P.M., Hb 118%, given 850 c.cm. plasma; 5.30 P.M. Hb 102%, given 500 c.cm. plasma. Operation then undertaken, preceded by tracheotomy. At 9 P.M., Hb 100%. The œdema soon lessened and there was steady general improvement. On May 26, Hb 115%, given 750 c.cm. plasma. During the next 14 days the Hb readings were not above 100%; 12 days after admission a blood-transfusion of 1000 c.cm. was given because the third-degree burns of the hands, ears, forehead and temporal regions broke down badly and were infected. The tanned areas on the back, shoulders, arms and buttocks healed well. Discharged after 5 weeks for skin grafting.



CASE 7.—Admitted 14 hr. after burns of the face, front of neck, right scapular region, outer surface of right arm and forearm and left antecubital fossa. Hb 118%, given 850 c.cm. plasma. Operation then undertaken; 12 hr. later Hb 104%, given 250 c.cm. plasma. Thereafter Hb readings were normal. Recovery uneventful.

CASE 8.—Admitted, severely shocked, 20 hr. after extensive burns of the face, neck, trunk and limbs. Hb 110%, given 450 c.cm. plasma. Died 3 hr. after admission.

CASE 9.—Admitted, with mild shock, 14 hr. after extensive burns and suffering from the effects of nitrous fumes. Hb 110%, given 450 c.cm. plasma. Died 14 hr. after admission.

CASE 10.—Admitted 14 hr. after burns of part of face, both wrists, inner side of right arm and left scapular region. Mild shock. Hb 104%, given 250 c.cm. plasma which reduced Hb to 96%. Uneventful recovery.

CASE 11.—Admitted 14 hr. after extensive burns of face, neck, trunk and limbs. Severe shock. Hb 103%, given 250 c.cm. plasma. Died 8 hr. after admission.

CASE 12.—Admitted 14 hr. after burns of face, front of neck, right pectoral region, arms and scapular regions. Mild shock. Operated on 8 hr. later and then given 500 c.cm. plasma. Made good progress for 2 days. Burns of back then began to break down. Developed severe streptococcal tonsillitis and pharyngitis and died 8 days after admission. Cause of death (autopsy), massive pulmonary atelectasis secondary to capillary bronchitis.

CASE 13.—Admitted 14 hr. after burns of face, neck, right arm and shoulder, left forearm, right buttock and thigh, and both scapular regions. Mild shock. Operation 5 hr. later followed by 500 c.cm. plasma. Recovery uneventful.

CASE 14.—Admitted 20 hr. after burns of face, neck, shoulders, back, left forearm and both hands. During next 33 hr. there was progressive hæmoconcentration and he was given 500 c.cm. plasma. Recovery uneventful.

CASE 15.—Burns of forearms, buttocks and right thigh. Admitted 14 hr. later. Mild shock. Hb readings increased from 90% to 102%, given 250 c.cm. plasma. Operation 11 hr. after admission with Hb 98%. Recovery uneventful.

CASE 16.—Admitted 14 hr. after injury. Perforated ear-drums, burns of face, front of neck, forearms, half of right leg and thigh. Operation 13 hr. later followed by 250 c.cm. plasma. Developed bilateral otitis media. Burns healed perfectly.

DISCUSSION

Although the mortality was high these men were severely injured and were not admitted until at least 12 hours had elapsed. After plasma infusions 4 patients (case 5, 8, 9 and 11), injured 14–44 hours previously, failed to respond, 13 injured 12–29 hours previously showed considerable improvement, and no patient died as a result of overloading the circulation.

It is essential to estimate repeatedly the degree of hæmoconcentration after plasma has been given; with extensive burns loss of fluid continued and was rapid enough to reconcentrate the blood. For example, case 2, with Hb 162%, required, according to calculation, 1914 c.cm. of plasma; yet the blood did not remain normal until 4450 c.cm. had been given over 3 days. It is important to realise that plasma transfusion in burns usually needs to be continued for 36–48 hr. because during this period plasma is still being lost into the burnt area.

Pulse-rates remained high for some time after infusion, but the rapid improvement in quality was a valuable indication of recovery. Blood-pressures were not taken.

Though some of the plasma was 6 months old and much of it from group O donors we have never resorted to the 1 in 50 dilution test of Knott and Koerner (1939). There was only one reaction: case 2 had a mild rigor after receiving 1500 c.cm. of plasma. This may have been due to the plasma, but the man's cot was exposed to a draught at the time.

In secondary shock after burns there is a fall in blood-volume due to loss of plasma. The mechanism producing this loss, estimated at 3500 c.cm. in 12 hours after a burn of a sixth of the body surface in a man of 10 stone (Mitchiner 1935), is complex, but increased capillary permeability (Moon 1939) and loss of serum from the burnt area contribute largely to it. If plasma infusion was delayed or treatment of the burn postponed we noted that the local œdema progressed, whereas after plasma had been given the œdema almost disappeared within 12 hours. Case 6 was an exception, for there the œdema was so severe that tracheotomy was necessary, and though improvement was considerable after 12 hours the œdema did not disappear for 36 hours. The volume of serum in unruptured vesicles, the rapid accumulation of exudate on a raw surface while it is being cleaned and the difficulties of controlling hæmoconcentration until the eschar was dry indicated the large amount of fluid lost from the burnt surface. In hot moist climates perspiration is an important factor. Sweating was profuse on admission and troublesome during convalescence. Profuse perspiration consequent on working in a hot moist atmosphere can lead to a loss of fluid which will provoke acute erythrocytosis (Wright 1937).

We have found that, provided the burnt surface is sealed by coagulation, plasma will restore to the circulation that fluid lost in the tissue spaces, provided capillary damage is not irreparable, and the skin loss can be balanced by oral administration of fluid, supplemented if necessary by rectal and intravenous saline. For this reason we feel some form of coagulant must be applied as a first-aid dressing if treatment is unavoidably delayed, and that although saline baths are of value when the patient's life is not threatened they have no place in the treatment of extensive superficial burns.

SUMMARY AND CONCLUSIONS

Plasma has merits in the treatment of shock associated with burns. The dilute citrated form has proved easy to prepare, safe and efficient, and seems at present to be the most useful in ships.

Its use in 16 cases of severe burns is reported.

Apart from one reaction, no ill effects followed infusions of even group O plasma in massive doses.

We have no experience of plasma in the treatment of shock associated with acute hæmorrhage or wounds, because whole blood has always been available and we do not suggest that plasma be substituted in hospital ships for this purpose. But the issue of stored blood to fighting ships is impracticable, because without a steady supply of casualties it will be wasted, and transfusion of fresh blood, with its attendant difficulties of grouping, matching and bleeding is rarely possible. Under such conditions we suggest the substitution of plasma.

After a naval action there is always a delay before the patient reaches hospital and these hours are vital to the type of casualty often encountered. Citrated plasma is much more valuable than saline or glucose saline as an anti-shock agent, and just as simple and safe in application, and an urgent plea is made for its adoption in ships.*

We wish to thank Surgeon Captain M. S. Moore for permission to undertake the work, and Surgeon Commander T. F. Crean, and Surgeon Commander J. Johnston for access to their cases. For technical assistance we wish to thank Surgeon Commander (D) L. R. Armstrong, and the theatre and laboratory staffs.

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THE POUCH OF HARTMANN

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THERE seems to be a general opinion among surgeons that the structure known as Hartmann's pouch is a feature of the normal human gall-bladder. A perusal of the literature and the examination of a number of gall-bladders removed post mortem have caused us to question this.

Dorland (1940) defines this structure as "a pouch at the exit of the gall-bladder into the cystic duct," and attributes its original description to Robert Hartmann (1831–1893), a German anatomist, professor at Halle. We have been unable to trace any such description in the writings of this author, but Henri Hartmann (1891) of Paris described the pouch, and clearly indicated that Paul Broca originally drew attention to it; H. Hartmann referred to it as "cette partie que Paul Broca avait justement dénommée 'bassinet de la vésicule.'" Broca (1850) figured and described the pouch and proposed to give it the name of "bassinet de la vésicule biliaire"; he considered it to be a dilatation of the upper part of the cystic duct and noted valvular folds of the mucous membrane both above and below it. Hartmann, however, considered the pouch to occupy the region of the neck of the gall-bladder, and he too described the valvular folds limiting it. He described the pouch as occurring in the normal organ, but his illustrations are drawn from five calculous gall-bladders. Later his assistant, Virenque (1923), in the anatomical section of Hartmann's book on the surgery of the biliary tract, made no reference to this pouch in describing the external configuration of the normal gall-bladder; but he described internally, in the region of junction of the neck and cystic duct, two valvules between which he found the "bassinet de Broca." He also observed that the gall-bladders described by Hartmann (1891) were all pathological.

As far as we have been able to determine, modern textbooks of normal human anatomy do not describe "Hartmann's pouch" as a feature of the normal human gall-bladder, but it is either described or accepted as a normal structure in a number of textbooks of surgery, surgical anatomy and pathology. On the other hand, many make no reference to it while others leave the reader in doubt whether it is regarded as normal or as resulting from impaction of a stone or from pathological dilatation of the gall-bladder.

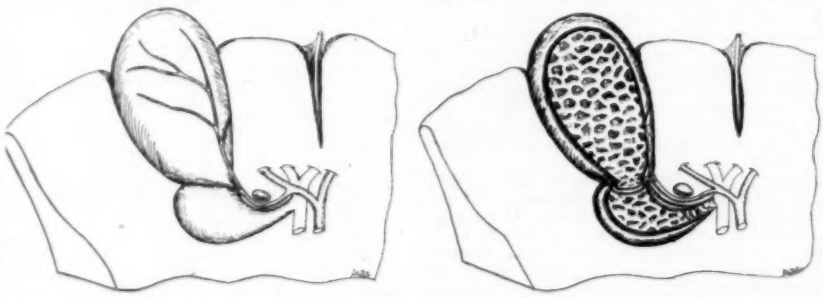
In an endeavour to clear up these discrepancies, we have examined 28 human gall-bladders, removed post mortem, comprising those of 12 children whose ages ranged from eight days to two and a half years, and 16

* The Medical Director General of the Navy informs us that dried serum is now being supplied to all ships as stocks are obtained

adults all over forty. The specimens were selected only to the extent that gall-bladders showing advanced disease were opened by the autopsy pathologist and only those without obvious disease were handed to us. Each specimen included the cystic duct, a part of the common bile-duct and a portion of the liver adjoining the gall-bladder. Immediately after removal from the cadaver the gall-bladder was largely emptied of its contained bile by means of a syringe and needle (passed through the fundus); the gall-bladder was then distended with 10% formalin, injected through the same orifice, the hepatic duct and common bile-duct having been ligatured. The whole specimen was then immersed in 10% formalin for fixation.

PERSONAL OBSERVATIONS

The precise definition of a pouch of Hartmann must be appreciated before its presence can be substantiated. While Broca maintained that this pouch was a dilatation of the upper part of the cystic duct, and Hartmann that it belonged to the region of the neck of the gall-bladder, they both agreed that it is not a uniform dilatation but takes the form of a sacculation which projects to the right, and from the left side of which the cystic duct continues. Externally this pouch is separated from the rest of the gall-bladder by a groove, deeper on the right side, while on the left side the junction of the pouch and the cystic duct forms a sinuous concavity in which Hartmann found a lymph gland. Internally two valvular folds of the mucous membrane bound the pouch. These arise on the left side from a promontory and diverge as they pass to the right, the upper one lying between the pouch and the rest of the gall-bladder, the lower one (according to Hartmann) separating the pouch from the beginning of the cystic duct. These folds are permanent and are not obliterated by artificial distension of the gall-bladder.



Adult gall-bladder showing sacculation resembling classical description of Hartmann's pouch.

In none of the gall-bladders from the children in our series was there anything resembling a Hartmann's pouch. Apart from one showing acute inflammatory changes of moderate degree, these gall-bladders were normal. Of the 16 adult gall-bladders, 3 were normal and showed no signs of a Hartmann's pouch. The other 13 showed some degree of pathological change; in only one of these was a sacculation present which can be considered to approach the classical description of a Hartmann's pouch (see figure). This specimen showed considerable general dilatation of the gall-bladder and of the extra- and intra-hepatic bile-ducts, indicating long-standing partial extra-hepatic obstruction. In the region of the neck of the gall-bladder, as seen externally, a pouch of considerable size projected to the right and downwards. It was demarcated from the body of the gall-bladder by a groove, deeper on the right and under surfaces. The left side of the neck was concave; in this concavity lay a lymph gland. Internally a prominent fold of the mucous membrane projected, forming a circular valve at the junction of the pouch and the body of the gall-bladder; immediately below the pouch the spiral valve of the cystic duct began; there was no fold of mucous membrane in the pouch itself. The lower part of the pouch tapered to the left into the beginning of the cystic duct. The cystic artery bore an interesting relation to this pouch. The main artery ran along the left border of the pouch between the lymph gland and the wall of the gall-bladder and attaining the body of the gall-bladder divided into two main branches which ran respectively on the under and upper surfaces towards the fundus. The main stem immediately prior to its bifurcation gave off a branch which ran to the right on the under surface of the gall-bladder in the groove demarcating the pouch.

Some points in the anatomy of the other gall-bladders may be noted. Of these, all of which had been artificially distended, 5 (2 children, 3 adults) showed slight, and 1 (adult) considerable constriction in the region of the junction of the body and the neck. Below the constriction there was a slight distension of the neck; this distension was uniform in 4 cases (2 children, 2 adults), and slightly greater on the right than on the left side in 2 cases (1 child, 1 adult). Only in 1 of these (adult) was a valvular fold of the mucous membrane present; this extended as a deep, almost circular fold (deficient in its right inferior quadrant) at the site of constriction; otherwise no folds were related to the constriction. In each case it was observed that a branch of the cystic artery (as above described) had a close relationship to the constriction. One specimen (adult) showed a shrunken, distorted gall-bladder, with a thick fibrous wall. Tightly held in the neck, and uniformly dilating it, was a cholesterol stone which blocked the entrance to the cystic duct. Above the stone was a dense fibrous contraction ring, just below which was a circular fold of the mucous membrane. Below the stone the cystic duct continued from the apex of the dilated neck. The remaining 20 gall-bladders (10 children, 10 adults) showed no indication whatever of any pathological dilatation, uniform or saccular, of the region of the neck.

The relation of the origin of the cystic duct to the apparent apex of the gall-bladder varies considerably. In the specimen which exhibited a well-marked Hartmann's pouch, the pouch narrowed as it passed to the left and continued into the duct; the duct thus arose to the left of, and slightly above the "apex" of the pouch. In those gall-bladders which distended uniformly without any constriction, the duct commenced at the apex in 10 cases (7 children, 3 adults), a little to the right of the apex in 8 cases (2 children, 6 adults), and a little to the left of and above the apex in 2 cases (1 child, 1 adult). Where a constriction existed between the body and the neck, and the dilatation of the neck was uniform, the duct arose at the apex in 4 cases (2 children, 2 adults); in one case (adult) with a uniformly dilated neck, the duct arose slightly to the right of the apex. Where the neck was dilated rather more on its right than on its left side, the duct arose to the left of the apex (2 cases; 1 child, 1 adult). The place of origin of the cystic duct cannot therefore be foretold from an examination of the external configuration of the gall-bladder.

DISCUSSION

In our series of gall-bladders those considered free from any pathological change (11 children, 3 adults) showed no evidence of a "Hartmann's pouch." This pouch is therefore not a structural feature of the normal human gall-bladder. In itself, the absence of such a pouch from the young gall-bladder suggests that the pouch, if present in an adult gall-bladder, is developed later in life. The absence of the pouch in the normal adult gall-bladder indicates further that it is the product of pathological changes. So far as the literature indicates—and this is borne out by our one specimen showing a pouch—the pouch appears to be associated with a dilatation of the gall-bladder. But, as shown in our series, not all pathologically dilated gall-bladders exhibit a pouch; some showed uniform dilatation of the neck separated from a uniform dilatation of the body by a constriction, while in others the neck bulged slightly more on the right side than on the left; this latter may be a stage in the production of the classical pouch. We

are not able to explain why the dilatation of the neck should be uniform in some cases and saccular in others. The relation of the transverse branch of the cystic artery to the constriction at the junction of the body and neck, to which attention is here drawn, may have some bearing on the method of production of the dilatation of the body and neck on either side of this artery (its action being analogous to that of aberrant renal arteries in the production of hydronephrosis); but other factors are also undoubtedly involved. In those cases where the neck of the gall-bladder sags downwards a little and then turns sharply into the cystic duct, external appearances may lead to an erroneous identification of a Hartmann's pouch, while internal examination may show no saccular dilatation of the neck. The number of gall-bladders examined in the present series is small, yet the information which they yield appears to us to be positive and to warrant our general conclusions.

SUMMARY

The saccular pouch of the neck of the gall-bladder, commonly known as the pouch of Hartmann, was originally described by Paul Broca. Omitting proper names, it might be called "the cervical pouch of the gall-bladder."

This pouch is not a structural feature of the normal human gall-bladder, either of the child or of the adult.

Its presence is associated with a pathological dilatation of the gall-bladder, but it is not present in all dilated gall-bladders.

A branch of the cystic artery, which occupies the site of constriction between the cervical pouch and the rest of the gall-bladder, may help to determine the demarcation of the pouch.

We are indebted to Dr. L. C. D. Hermitte of the Pathology Department for drawing the figures.

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INTRAPERITONEAL SULPHAPYRIDINE IN ACUTE ABDOMINAL CONDITIONS

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IN the past year much attention has been paid to the local use of sulphonamides in the treatment of wounds both as a prophylactic and as a curative measure, but there have been few reports on the effects of sulphonamides applied locally in acute inflammation of the peritoneum. The earliest experimental work on chemotherapy had a bearing on this method of treatment and Colebrook reported that he had found it useful, but other workers denied its efficacy. Hudson and his colleagues (1941) found that in rabbits intraperitoneal sulphanilamide prevented the development of peritonitis when the cavity had been contaminated by the contents of the cæcum, and that it reduced the inflammatory process following resection of the gut. Rosenburg and Wall (1941) reported a 50% recovery-rate in rats which had been given a *Bacillus coli* peritonitis and had then been immediately treated by local chemotherapy. They also tried the effect of sulphonamides on 10 cases of peritonitis of appendicular origin with encouraging results.

I record here the results of the use during the past year of sulphapyridine in some acute abdominal conditions at the Royal Buckinghamshire Hospital and an E.M.S. hospital.

CASES AND TECHNIQUE

Of 19 cases treated, 15 were cases of acute appendicitis with perforation of the appendix; several of the appendices were gangrenous, and all the patients had purulent fluid present in the abdominal cavity, with varying grades of peritonitis—2 had general peritonitis. All 15 were cases in which I considered drainage of the abdominal cavity essential, and I should also have drained the abdominal wound if chemotherapy had not been employed. There were also 2 cases requiring resection of the small gut, one owing to adhesions causing gangrene, and the other owing to gangrene from strangulation of a right inguinal hernia. Finally there were 2 cases of perforation of the large bowel, one due to a perforated diverticulitis, the other a case in which I accidentally perforated the sigmoid colon during a sigmoidoscopy.

Operation was performed in all cases under general anæsthesia (gas, oxygen and ether). I usually made a right paramedian incision, but used the gridiron incision in some of the appendix cases. At the end of the operation, before sewing up, 10 g. of finely powdered sulphapyridine was stirred up in 4 oz. of saline to make a fine suspension. Some of this was then injected with a 10 c.cm. Record syringe into the peritoneal cavity around the operation area and a second amount into the pelvis. The 15 appendix cases and the 2 cases of large bowel perforation were drained with a small tube, either suprapubically or through a stab wound in the right iliac fossa. The peritoneum was then sutured, but just before the insertion of the last stitches more of the sulphapyridine suspension was injected into the peritoneal cavity, which was then closed. The last of the suspension was injected down the tube, which was at once clipped or closed with a spigot. Unless this is done much of the suspension will flow out of the tube and be lost; it is also lost if the peritoneum is not partially closed before the main injection. The powdery dregs remaining were rubbed into the wound layers and the abdominal wall was closed. Routine treatment followed, and intravenous saline was only given in two or three cases which were complicated by severe toxæmia. Except in one case with a pulmonary complication no sulphapyridine was given by any other route.

APPENDICITIS

In the cases of appendicitis, instead of a profuse discharge setting in about the 2nd or 3rd day to be followed by a frankly purulent discharge lasting 2–3 weeks, only a thin yellow, almost serous fluid was discharged in no great quantity. This gradually lessened and the drainage-tube was usually removed on or before the 5th day after operation; the discharge then gradually dwindled away, and in nearly all cases the wound was dry by the 10th day. All except one of the wounds healed by first intention and were soundly united by the 10th day. The one which did not heal was in an old lady of 75 with a perforated gangrenous appendix and early general peritonitis. The wound—a right paramedian—opened in two places each half an inch across to allow a thin purulent discharge to escape for a few days. This finally dried up and sound healing followed. I felt no anxiety that the wound might break down in this or any other case. It does not seem, therefore, that the rate of absorption of catgut is accelerated by the presence of sulphonamides in the wound (Adeney 1941). The general state of the patients did not seem to be affected by the drug. There were no signs of intoxication or excessive vomiting and none complained of feeling generally ill, although all these symptoms are commonly associated with the drug given by mouth.

A boy of 15 showed signs of a pelvic abscess on the 10th day, but this subsided with fomentations to the abdomen and expectant treatment in 3–4 days. In a woman of 41, slight basal pneumonia set in on the 9th day when healing was complete, but she responded well to sulphapyridine by mouth.

The average length of time in bed was 11–12 days and patients were usually discharged home on the 14th day; one or two cases remained up to 3 weeks, because they were elderly or stout women. This is a much shorter time than has been usual in the past, when frank pus drained out of the drainage hole and wound for weeks. The average stay in hospital, therefore, has been much diminished. This case is typical:

A married woman of 20 was delivered of a healthy child after a normal labour on Aug. 19, 1941. On Aug. 21, at 11 A.M., she complained of sudden pain in the right loin. She became worse during the day, and appendicitis seemed probable at 6 P.M. She became rapidly worse in the next two hours, with a pulse-rate up to 140, and looked exceedingly ill. Operation at 9 A.M. (gridiron incision). As soon as the peritoneum was opened there was a copious gush of thin yellow pus, and afterwards a large quantity was sucked out. She had advanced general peritonitis of a fulminating type from perforation of a gangrenous retrocæcal appendix, with no

adhesions. The appendix was removed with difficulty. A suprapubic stab drain was inserted and a corrugated rubber drain brought out through the gridiron incision. Sulphapyridine was put in in the usual manner and a continuous drip saline started at once. Thin yellow fluid drained for 6 days. Her only trouble was the loss of the breast milk, which was deliberately dried up. She ran a slight fever for 2 days, but made an uninterrupted recovery and was discharged on Sept. 2.

PERFORATION OF LARGE GUT

In the two cases of perforation of the large gut end-results were also good. In a case of perforated diverticulitis with advanced pelvic peritonitis a small hole in the pelvic colon was closed and reinforced with an appendix epiploica; the pelvis was drained after sulphapyridine had been put in. In a case of perforation of the sigmoid colon with the sigmoidoscope laparotomy was done at once. A rent ½ in. long was found in the pelvic colon and was closed with two tiers of fine catgut sutures; a small quantity of faecal matter was mopped out of the pelvis, which was drained and had sulphapyridine put in. In neither case was a colostomy performed and both made a good recovery, although the second case showed signs of mild intestinal obstruction which later disappeared.

ACUTE OBSTRUCTION REQUIRING RESECTION

A youth of 18, who had been operated on for appendicitis as a baby, was admitted after 2 days of repeated vomiting and a distended abdomen. At operation most of the small gut was found to be obstructed, with dense adhesions in the right iliac fossa. A coil of the ileum was bound down by adhesions and when released 2 in. of it were found to be gangrenous; 2 ft. of gut were resected and the bowel united by a side to side anastomosis. Sulphapyridine was placed in the abdominal cavity and the abdomen closed without drainage. After a rather stormy convalescence the patient made a complete recovery.

A man, aged 49, was admitted with a strangulated right inguinal hernia of 20 hours' duration. A sac containing foul fluid with 3 in. of gangrenous ileum was found and opened. The obstruction was released and 2 ft. of bowel was resected and an end-to-end anastomosis done. Sulphapyridine was placed in the abdominal cavity, the inguinal canal was rapidly repaired and the wound closed without drainage. He stood the operation well and appeared to make good progress, except for a little vomiting, until the 5th day, when his temperature rose to 102° F. and his pulse-rate to 100; these fell on the 6th day, the pulse-rate remaining at 90. Clinical examination failed to elicit any signs; his abdomen was never rigid or tender, and his tongue was clean. On the 7th day he began to vomit slightly and complained of abdominal pain and diarrhœa, but there were still no physical signs. He collapsed and died suddenly on the morning of the 11th day. At autopsy (abdomen only) the wound was soundly healed; there was a general plastic peritonitis, with matting together of the small gut, and large quantities of glairy purulent material. The bowel tore open when attempts were made to separate its coils, especially round the site of the anastomosis, although union appeared to be satisfactory.

DISCUSSION

Unfortunately I have not had the abdominal fluid in these cases examined bacteriologically, and no record was made of the blood sulphapyridine concentration. These should be recorded in all future work on these lines. For success, the bacteria responsible for the peritonitis must be susceptible to the drug employed, and this must be adequately distributed and must persist in situ long enough to be effective. In the only case in my series which came to autopsy there were no signs of sulphapyridine remaining 11 days after its insertion into the abdominal cavity.

A combination of local and systemic administration will possibly give even better results. The sound healing of the wounds in this series suggests that in future the incidence of postoperative hernia will be greatly lessened. I have seen one case of wound phagedæna following the removal of a gangrenous appendix in a fat old lady, in whom spread was rapid and a large area of abdominal skin was soon involved with fatal results. Chemotherapy in the wound may make such rare disasters impossible.

SUMMARY

A series of 15 cases of perforated appendix, 2 cases of perforation of the sigmoid colon and 2 cases of resection of gangrenous small gut have been treated with intraperitoneal sulphapyridine.

All cases except one recovered, and none had the prolonged outpouring of thick pus from the abdominal cavity and wound common in such cases. The period in hospital was thus much shortened. One patient died of peritonitis.

In further trials of this measure bacteriological examination of the abdominal fluid and records of the blood sulphonamide should be done.

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PERSISTENT MYALGIA FOLLOWING SORE THROAT

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DURING the last war, myalgia was an extremely common diagnosis for pains apparently arising in the muscles. A big proportion of cases so diagnosed proved to be trench fever, and since the virtual disappearance of that disease after the war little has been written on muscle pain. The recent outbreaks of trichiniasis have roused fresh interest in this subject. In this paper a small epidemic of myalgia is recorded and its clinical features and differential diagnosis discussed.

CLINICAL PICTURE

The cases described were members of the nursing staff all of whom started the illness with a streptococcal sore throat, but the streptococci were of different types. After a day or two in which they ranged up to 103° F. the temperatures fell almost to normal and then rose again, maintaining a range of 98°–99° F. in the mornings to 100°–101° F. in the evening, this rise persisting for periods of from 3 weeks to 5 months in different cases. Rectal temperatures, taken over a week, confirmed a true pyrexia.

Some 8–21 days after the initial sore throat pains appeared in the muscles, a common sequence being pains in the left side of the chest, then in the calves of legs, thighs, arms and neck. The pain was aggravated on movement, was always worse at night and was sufficiently severe to withstand the action of A.P.C. tablets, and 'Nepenthe' and aspirin. Three types of pain were complained of in the limbs—a dull boring pain, a sharp localised pain, and a shooting pain running the length of a muscle to the toes or fingers. The chest pains disappeared after a few days but the limb pains sometimes persisted for months. The skin overlying a painful area was never reddened or indurated. Seldom was pain complained of in the identical site for more than 2 days, flitting being a pronounced feature. The painful area was usually in the belly of a muscle near its free border or near the musculotendinous junction and on many occasions a definite hardening could be palpated in a muscle over the area complained of and pressure on this area produced acute pain shooting down the limb. In one case with pain in the supinator longus muscle, a skin incision was made and pressure exerted directly on the exposed muscle which had felt hardened; a sharp pain was produced identical with the previous spontaneous pain. A biopsy on a piece of muscle which appeared indurated showed no abnormal histological features, and aspiration of a small quantity of fluid from a similar area was sterile on culture on ordinary media, on the chorioallantoic membrane of a chick, and on injection intracerebrally and intraperitoneally into mice. Owing to the flitting of the pains local injection of 'Procaine' was not feasible; and salicylates, sulphonamides, vaccines and local heat had no noteworthy effect. In no case did a cutaneous eruption appear.

Other striking features of the series were severe headache, with neck rigidity in one case, coming and going for weeks or months, waves of depression, and menstrual

disturbances in the form of amenorrhœa, delayed periods or oligomenorrhœa. Epistaxis was common and hæmorrhages appeared under the lunules of the nails of the toes in two cases. Apart from a mild grade of anæmia, the blood-count was normal in all, the blood-sedimentation rate was but slightly raised and agglutination reactions for *Brucella abortus*, Weil's disease and the enteric group were all negative. Cerebrospinal fluid was normal in the one case lumbar punctured. All the patients eventually made a complete recovery with no residual symptoms.

A careful investigation was made to try and determine a common cause for these cases. All the patients ate the same type of food but all were not taken ill simultaneously nor was there any gastro-intestinal disturbance. The small number of people affected in comparison with the several hundred eating the food seemed to exclude this possibility. The nurses were not on duty in the same ward and there was no evidence whatsoever of any insect vector being involved. Mosquitoes were plentiful but again the small number of cases in relation to the number bitten seems to eliminate this possibility.

Trichiniasis, however, had to be excluded further, in view of the outbreaks recorded by Sheldon (1941), Lee (1941) and Garrod and Maclean (1941). The subungual hæmorrhages were suggestive, but the absence of œdema of the eyelids, the normal blood-count (see Della Vida and Dyke 1941), the negative biopsy and the long course with the flitting type of pain seemed to rule out that diagnosis fairly definitely. Through the kind assistance of Dr. J. R. Hutchinson of the Ministry of Health, Dr. Paul Beeson performed skin tests and the precipitin reaction with trichinella antigen on five of the patients in April, 1941, and found all tests negative. The negative X-ray findings, as indicated by Beeson (1941), are of no significance for or against trichiniasis.

CASE-HISTORIES

CASE 1.—Aged 22. Admitted Nov. 5, 1939, with sore throat and pains in the back. Temperature 99° F., injected fauces but nothing else abnormal. Sulphanilamide, 1 g., given 4-hourly for 6 doses, but temperature remained in the region of 100°–102° F. and the sore throat persisted. Heart and lungs normal throughout. Pulse-rate usually 80–90. Spleen not palpable at any time. She felt ill and had severe headache. A course of sulphapyridine (total 4 g.) also had no effect on temperature or sore throat. On Nov. 20 she complained of pain in left side of chest near sternum. On Nov. 22 chest pain had gone but pains now appeared in legs and persisted, being worse at night and on movement; exact site of pain varied almost daily. A week later had pains in arms shooting down to fingers, with a dull ache when shooting was not present. Menses a week late. Severe headache continued with suggestion of neck rigidity at times. In December muscular pains were still present but a little less severe. An autogenous streptococcal vaccine had no beneficial effect. In January, 1940, pains were very bad, mainly localised in right sternomastoid and calf muscles. Palpable thickening in right sternomastoid at site of pain; no definite thickening in calf muscles. No cutaneous eruption. Epistaxis occurred on two occasions and a spontaneous hæmorrhage appeared under nail of right big toe. Several bouts of depression during illness, usually associated with severe headache. At end of January pains gradually disappeared and 10 days later the temperature (which had ranged from 99° to 101° F. throughout the illness) had fallen to normal. Recovery was complete.

Investigations.—Culture of throat swab: streptococci type 22 present. Blood-count on Nov. 23: red cells 4,430,000; Hb 90%; white cells 7000 (polymorphs 51%, eosinophils 2%, mononuclears 12%, lymphocytes 35%). Feb. 5: polymorphs 61%, eosinophils 3%, monocytes 8%, lymphocytes 28%. Wassermann and Widal reactions negative. Agglutination reactions for Weil's disease and undulant fever negative. Blood-sedimentation rate (Westergren) 5 mm. per hour. CSF normal. Fæces: excess of enterococci.

CASE 2.—Aged 33. Admitted Oct. 29, 1939, with sore throat and shivering. Temperature 103° F. Fauces inflamed with grey exudate on left tonsil. Sulphanilamide given, and temperature fell to normal in 4 days; after 2 days rose again and continued to niggle up to 100° F. for 3 weeks. Further doses of sulphanilamide failed to affect temperature. Fauces and tonsils remained injected for a week, then cleared. On Nov. 4, complained of headache, which persisted; treated with tab. A.P.C. On the 11th had severe pains in back of neck. On the 21st had bad pains in legs, headache and recurrence of sore throat. Next day leg pains had gone but had pain in right sternomastoid; indurated area could be palpated for 2 days in this muscle, ½ in. from its insertion, corresponding to site of pain. On the 24th all pains had disappeared; temperature normal on the 25th, and she subsequently remained free from symptoms.

Investigations.—Throat swab grew a hæmolytic streptococcus. No agglutinations done. Blood-count on Nov. 23: white cells 9200 (polymorphs 56%, eosinophils 1%, monocytes 6%, lymphocytes 37%). B.S.R. 16 mm. per hour.

CASE 3.—Aged 34. Admitted Oct. 22, 1939, with a cold. Temperature 98·8° F. Oct. 30: sharp pain in left side of chest and pains in legs; felt ill and had slept badly. No evidence of infection in throat and no abnormal physical signs in any system. No rash or splenic enlargement. Temperature 99°–101° F. in evenings for 6 weeks from date of onset. On Nov. 2 had sore throat and pains all over. Nov. 4 and 5: sulphanilamide given with no effect on temperature; pains a little better. On the 10th temperature rose to 100·4° F.; not affected by sulphapyridine. Salicylates also ineffective. Pains in legs persisted until Dec. 2 when they improved. As in case 1, they varied in intensity and location. Muscles tender at site of pains but no induration felt. Menses lasted 2 days instead of usual 7 days. Had difficulty in micturition for which no local cause was found. Headaches occurred but were not severe. Dec. 2: temperature returned to normal, and on the 19th she was discharged symptom-free.

On returning from sick leave on Jan. 4, 1940, she reported that she had had pains in the legs while she was away and that on Dec. 22 her legs had swelled up from knees to ankles, the swelling being confined to the calf muscles which were very painful and sore to touch. While her legs were swollen (Dec. 22–24) there was oozing of blood from the cuticle of each nail of both feet lasting for one day only. Patient is a credible witness. On Jan. 19 was still having pains in legs and frequent headaches; menses now occurred every fortnight. By the end of January had made complete recovery.

Investigations.—Throat swab grew few hæmolytic streptococci and many indifferent streptococci. Agglutination for Weil's disease negative. B.S.R. (Westergren) 3 mm. per hour. Urine normal. Blood-count on Nov. 23: red cells 3,690,000; Hb 70%; white cells 7800 (polymorphs 59%, eosinophils 2%, monocytes 6%, lymphocytes 33%). X ray of limbs and pelvis in April, 1941, showed no calcification in muscles.

CASE 4.—Aged 24. Admitted Oct. 13, 1939, with sore throat and hoarseness. Diagnosed as simple laryngitis. Temperature ranged between 101° and 102° F. for 6 days, then settled to normal. Sore throat disappeared, and apart from sleeping badly she felt fairly well. On Oct. 30 had pain in left side of chest and temperature rose to 98·8° F. No abnormal physical signs; X ray of chest normal. Next day chest pains still present, and also pains shooting all over body. On Nov. 2 pains in all joints and severe headache in spasms. Temperature 99° F. each evening. Pains later in muscles of legs and neck, and definite thickening could be felt in painful neck muscles. Fainted frequently (never having fainted previously) and had attacks of vomiting after food. Pains and headaches persisted; muscle pains, as in the other cases, were flitting. Pains still present on Dec. 7 but she felt much better. Temperature for the previous 5 weeks had been 100°–101° F. in the evenings and had not been affected by sulphanilamide, aspirin and nepenthe, or Dover's powder. An autogenous hæmolytic streptococcal vaccine had no beneficial effect. On Jan. 12 still had pains in legs; temperature 99° F. in the evenings. Occasional headaches and fainting attacks continued. Menses normal throughout.

Investigations.—Throat swab grew hæmolytic streptococci, *Streptococcus viridans* and many indifferent streptococci. B.S.R. on Dec. 18 at height of pain, was 2 mm. per hour. Culture of fæces showed excess of streptococci. Blood-count on Nov. 23: red cells 3,300,000; Hb 67%; white cells 6000 (polymorphs 46%, eosinophils 2%, monocytes 5%, lymphocytes 47%).

CASE 5.—Aged 23. Admitted Oct. 31 with sore throat and headache. Tonsils injected, with exudate. Temperature 102° F.; fell to normal in 2 days after sulphanilamide, 3 g. Sore throat persisted and temperature rose again on Nov. 12 and continued to rise to 100° F. in the evenings for further fortnight. On Nov. 21 complained of headaches, pains in calves at night; later, pains in arms and shoulder muscles, not severe—a dull ache. An autogenous streptococcal vaccine had no effect. Dec. 16: was free of pain and remained

well subsequently. Menses a week overdue on one occasion, but otherwise normal.

Investigations.—Culture from throat grew hæmolytic streptococcus, Lancefield group A, type not determined. Blood-count on Nov. 23: white cells 8000 (polymorphs 50%, monocytes 12%, lymphocytes 38%). B.S.R. 18 mm. per hour. X ray of limbs and pelvis in April, 1941, showed no calcification in muscles.

CASE 6.—Aged 23. Admitted Oct. 27 for sore throat following a cold; exudate on both tonsils. Appeared to have severe tonsillitis; no other abnormal findings. Temperature raised at first but soon fell; rose again after 2 days to 99·6° F. each evening. Sulphanilamide 3 g., followed a week later by sulphapyridine 8 g., had no effect on temperature or general condition. On Nov. 6 pains in muscles of chest, back and legs. Later, pain in arms as well as legs, worse at night or after bath, site varying from day to day. Tender indurated areas in muscles of calves, thighs, neck and arms; pressure on these reproduced pain. Biopsy on a piece of muscle tender on exposure revealed nothing abnormal except doubtful increase in sarcolemma nuclei. Fluid aspirated from another painful area cultured for bacteria and virus with negative results. Pains of three kinds: dull ache, sharp localised pain, and shooting pain running into fingers or toes; cramps common at night in legs. Severe headaches almost every day; periods of depression prominent. No evidence of intracranial mischief; no alteration in deep reflexes. Headache controlled by tab. A.P.C., but temperature and pains unaffected by salicylates, aspirin and nepenthe, Dover's powder, sulphanilamide or sulphapyridine. Autogenous streptococcal vaccine had no beneficial effect. No signs of cardiac or pulmonary involvement; X ray of chest negative; blood-pressure 128/80 mm. Hg. No skin eruption. Spleen not palpable. Menses 11 days overdue, otherwise normal. Blood-culture negative. Skin tests with streptococcal endotoxin negative. Wassermann and Widal reactions and agglutinations for *Br. abortus* and Weil's disease negative. Nov. 23, blood-count: white cells 7200 (polymorphs 64%, eosinophils 1%, monocytes 6%, lymphocytes 29%). Dec. 18, when pains severe, B.S.R. 4 mm. per hour. Temperature continued to rise to 100°–101° F. until January, 1940, when antrostomy done on left maxillary antrum, which was full of pus giving a pure culture of *Staphylococcus aureus*. Operation had no effect on symptoms. Feb. 5, blood-count: red cells 4,540,000; Hb 80%; white cells 6400 (polymorphs 60%, eosinophils 2%, monocytes 5%, lymphocytes 33%). B.S.R. 17 mm. per hour. Temperature, pains and headache persisted until March; she was then allowed home where her condition remained unchanged until July 1940 when she gradually recovered.

CASE 7.—Aged 19. Admitted Nov. 6, 1939, with sore throat. Temperature 101° F.; exudate on both tonsils. Throat swab grew a hæmolytic streptococcus, type 2. After sulphanilamide, 3 g., temperature fell to normal and remained so for 5 days, sore throat having disappeared. Temperature then rose to 99·2° F. and continued to rise each evening up to 100·4° F. for a fortnight, then falling to normal; she felt well despite temperature. Observed for a further fortnight but remained afebrile, and has remained well since. This case appears to be a forme fruste of the other cases.

DISCUSSION

Gowers (1899), Langmead (1923), Levison (1937), Blau (1938) and Somers (1939) have described cases of polymyositis whose essential features were slow progress, lack of severe pain, "pasty" feel and eventual paralysis of the affected muscles. The overlying skin was glossy and œdematous and many were cases of dermatomyositis. Fever was usually absent except in the early acute stage. The condition may follow a wide variety of infections such as the exanthemata, typhoid, tuberculosis or erysipelas (Kinnier Wilson 1940). Others (Krohn 1937, Sick 1905, McAlpine 1935, Rotky 1912) have described cases of acute recurrent polymyositis, most of which showed a high eosinophilia but no evidence of trichiniasis. The general course and symptoms were different from the cases we have described above. Bornholm disease—epidemic myalgia—as described by Pickles (1933), Sylvest (1934), Macdonald (1938) and many others, resembles our cases in the distribution of the pains but differs in the other symptoms and the short course of the disease. We consider that the absence of true joint pains and cardiac involvement, together with the normal B.S.R. and failure of salicylates to influence the pain, eliminates rheumatic fever; and the flitting and other characters of the pain, with the constitutional symptoms, are unlike simple fibrositis. Gutstein-Good (1940) suggests the term idiopathic myalgia for pains arising in muscle for which no obvious cause can be found. In his cases the affected areas remained constant and did not shift their location from day to day and referred pain was a prominent feature.

The condition which resembles our cases most closely is trench fever. The severe headache, flitting pains and long course extending over weeks or months, with pyrexia and eventual complete recovery are striking resemblances. Byam (1922) notes that three types of pain are common in the limbs in trench fever: boring, aching and shooting. These are similar to the pains in our cases. The complete absence of lice and of the typical macular rash, however, serve to distinguish the two conditions.

The term myalgia is preferable to myositis in the description of this condition, since there is no histological evidence of inflammation. No common ætiological factor could be found in these cases except a preceding sore throat, and the course was essentially the same in all except for the length of time the condition persisted. The similarity of the condition to trench fever and Bornholm disease suggests a myotropic strain of virus, and in the absence of positive bacteriological findings we suggest tentatively that an unidentified virus is the cause. Further work on similar cases should settle the problem.

Lately Williams (1941) has described a small epidemic of myositis in Service personnel in the spring of 1940. His cases had evidence also of a true neuritis, with meningeal symptoms and a rash, and in various other ways differed from our cases. A virus infection was assumed, as for our cases, and it is possible that our epidemic was a milder but more prolonged form of the condition described by Williams.

SUMMARY

Seven members of the nursing staff of a hospital developed sore throat, followed in 8–21 days, in six of them, by pains in the muscles and severe headache. Two cases showed subungual hæmorrhages in the toes. Pyrexia and pains persisted for up to 5 months; and there were menstrual disturbances and spontaneous epistaxis. All investigations done, including skin tests and precipitin reactions for trichiniasis, gave a negative result. Biopsy of a painful indurated area in a muscle showed no abnormal findings and no treatment was found to be of any value. All the cases made a complete recovery without any sequelæ. It is suggested that the condition is due to an unidentified myotropic strain of virus.

We wish to thank the County Medical Officer of Health for Middlesex and Dr. K. R. Stokes, medical superintendent of Harefield Sanatorium, for permission to publish these cases; Prof. Alexander Fleming for his help in the bacteriological investigation; Dr. F. Himmelweit for help in the search for a virus; and Dr. J. R. Hutchinson, of the Ministry of Health, and Dr. Paul Beeson for their help in excluding trichiniasis.

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PYRUVIC ACID TEST FOR VITAMIN-B_1 DEFICIENCY IN CHILDREN

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Now that the public has been exposed to war conditions and a restricted diet for over two years the medical profession is justified in being on the watch for signs of incipient malnutrition and deficiency disease. The clinical signs of the fully developed deficiency diseases are well known but it would obviously be an advantage if biochemical findings could give warning of the early changes and hence suggest an alteration in the quantity or quality of the diet, particularly in children. At present there are no signs of clinical beriberi but with existing restrictions in our diet, some degree of vitamin-B_1 shortage is possible; this is the more likely since the proportion of carbohydrate in the diet is increased and there is consequently a heightened demand for B_1. The proposed fortification of bread with vitamin B_1 must be regarded as a measure for forestalling a deficiency of that vitamin.

Platt and Lu (1936) have provided a means of detecting B_1 deficiency. They found that in human subjects suffering from beriberi the blood pyruvic acid was increased from the normal value of about 1 mg. to 3 mg. per 100 c.cm. It seems likely, therefore, that in subclinical states of B_1 shortage there will be an increase of pyruvic acid in the blood above the normal values. The blood pyruvic acid in a series of children in the Royal Hospital for Sick Children, Glasgow, has therefore been estimated. Two classes of children were examined: children just admitted to hospital for the removal of tonsils and adenoids, that is, before they had been subjected to a hospital diet (the normal cases); and children in hospital suffering from various diseases, grouped as surgical cases, medical cases and cases under ether anæsthesia. The method of estimation depends on the formation of a pyruvic acid dinitrophenylhydrazone from the blood filtrate. Klein's (1941) modification of Lu's (1939) method was adopted; this eliminates the error due to the presence of aceto-acetic acid.

RESULTS

In children on home diet (those just admitted to hospital) the average blood pyruvic acid is 0·99 mg. per 100 c.cm. (see table). This agrees closely with the figure (0·96 mg. per 100 c.cm., range 0·7–1·2 mg.) obtained by Wortis and his colleagues (1941) from a poor class of children in the United States and considered by them to be normal. The second group (surgical cases) includes children who had been in hospital for varying periods after operations for cleft palate, hernia, appendicectomy, &c.; the blood was taken in all cases when they were almost due for dismissal and none had fever at the time. These cases had all been operated on 7–30 days before and were apparently healthy when the blood sample was taken. The object of including them was to ascertain whether hospital diet over a period of 7–30 days had any effect on the blood pyruvic acid as compared with that of children in group 1 who had just come from home. The average figure is approximately the same as that found in the first group although the range is somewhat greater. The third group (medical cases) are all just above or below the average although the range is greater than that found in groups 1 and 2. In the few cases in which blood was taken while the patient was under ether anæsthesia, the figure was below the average. The blood was taken when they had been under ether for at least half an hour. The low values may possibly be associated with the disturbance of carbohydrate metabolism which Macintosh and Pratt (1938) have shown to occur in anæsthesia, for pyruvic acid is known to be one of the intermediate products of carbohydrate oxidation.

BLOOD PYRUVIC ACID IN CHILDREN JUST ADMITTED TO HOSPITAL FOR TONSILLECTOMY AND IN OTHERS IN HOSPITAL FOR VARIOUS CONDITIONS

Group	No. of cases	Average pyruvic acid	Range
		(mg. per 100 c.cm.)	
1. Just admitted	35	0·99	0·63–1·22
2. Surgical conditions (7–30 days after operation)	30	1·05	0·54–1·36
3. Medical conditions:			
Upper respiratory infections	8	0·84	0·53–1·17
Gastro-enteritis	12	1·13	0·72–1·8
Marasmus	4	1·05	0·90–1·2
Convulsions and rickets	6	0·93	0·76–1·3
Renal and urinary infections	8	0·91	0·69–1·98
4. Under ether anæsthesia	7	0·67	0·54–0·91

These data indicate that the blood pyruvic acid in normal children of the hospital class is not raised above the figure found in a similar class of children studied in America, and this seems to suggest that there is no deficiency of vitamin B_1 in their diets. In children with gastro-enteritis, nephritis or convulsions high values were found in a few cases although there were no clinical signs of B_1 deficiency.

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BARBITURATE POISONING TREATED WITH PICROTOXIN

MAURICE FISHMAN, M.B. LOND.

SINCE barbiturate overdosage was first treated by the intravenous administration of picrotoxin solution seven years ago 25 cases have been recorded. Of these 18 have recovered and in the remainder life was prolonged.[1] The following case was successfully treated by this method.

A married woman of 54, while in a state of alcoholic intoxication, attempted suicide by taking 1·46 g. (gr. 22½) of pentobarbital sodium ('Nembutal.') This was at 2 P.M. on Sept. 23, 1941. At 2.45 P.M., when I first saw her, she was in deep coma, collapsed, and did not respond to any external stimulus. Respiration was shallow, rate 24 per min., pulse regular but of poor volume, rate 60 per min., temperature subnormal. The skin was cold and dry. The corneal reflex was absent and the pupils were pin-point, not reacting to light. She was at once given 3·2 c.cm. of 'Coramine' intramuscularly and a mixture of CO_2 and air by mouth. Warmth was maintained by an electric blanket. There was no obvious change and a further 2 c.cm. of coramine was given 15 min. later. This resulted in some improvement in pulse volume and respiration became deeper, but the patient remained in a deep coma which showed signs of becoming deeper.

At 4.16 P.M. a 0·3% (isotonic) aqueous solution of picrotoxin became available and intravenous injection was begun, the dosage being as follows:

1st injection	4.16 P.M.	1 c.cm.
2nd ,,	4.27 P.M.	1·5 c.cm.
3rd ,,	4.45 P.M.	2 c.cm.
4th ,,	5.5 P.M.	3 c.cm.
5th ,,	5.45 P.M.	1·5 c.cm.

The total amount of picrotoxin solution given was 9 c.cm., which contains 27 mg. of picrotoxin. About 5 min. after the 1st injection breathing became deeper and more normal in character, but at the end of about 20 min. the patient relapsed into her former state. After the 2nd injection the improvement was repeated, the pupils dilated and the corneal reflex returned. Towards the end of a further 20 min. these improvements showed signs of subsiding and the 3rd injection was given. After this, the patient became restless for a few minutes and slight muscular twitchings were observed around the mouth. After the 4th injection the patient became increasingly restless, responded to external stimulation and there was profuse salivation. There was still evidence of these improvements slightly subsiding 40 min. later, so a further 1·5 c.cm. of picrotoxin solution was given. The patient now made involuntary movements and spoke incoherent phrases. She made several attempts to get out of bed and had to be restrained. She later fell into a peaceful sleep and awoke some four hours later in a normal mental and physical state.

1. Lovibond, J. L. and Steel, G. C. *Lancet*, 1939, ii, 561.

COMMENTS

A dose of gr. 22½ of pentobarbital sodium is sufficient to cause severe barbiturate intoxication, sometimes fatal.[2] The intravenous injection of picrotoxin solution was carried out when the drug was having its maximum effect. The amount of picrotoxin administered was adequately divided and spaced, so as not to provoke convulsions but to produce restlessness and spontaneous movements. Injections were continued until a substantial decrease in coma became apparent and the patient did not relapse as the effect of the picrotoxin wore off.

Reviews of Books

Year Book of Radiology, 1941

Editors: C. A. WATERS, M.D., W. B. FIROR, M.D., I. L. KAPLAN, M.D. Chicago: Year Book Publishers; London: H. K. Lewis. Pp. 440. 27*s.* 6*d.*

THE present difficulty in obtaining foreign scientific periodicals will make this tenth Year Book specially welcome to British radiologists with its well-illustrated abstracts on X-ray diagnosis and therapy. In the bone section there are good abstracts on pseudo-fractures, on bone and joint changes resulting from interruption of circulation, and on the joint changes in hypothyroid children: these seem identical with those in osteochondritis of the hip-joint. Efforts are being made to improve so-called contrast media, three of which are described. From Farinas in Cuba comes a paper showing the advantages of iodoxyl over iodised oil in lung investigations. Nichols and Nosik of the Cleveland Clinic describe a safe method of using 'Thorotrast' instead of iodised oil for myelography; 80% of the thorotrast can be recovered by forced drainage and the little remaining is well below the minimal amount from which toxic changes have been observed. And Rating of Breslau describes good results from using phenylpropionic acid instead of sodium tetriodophenolphthalein for visualisation of the gall-bladder. In the gastro-intestinal section there is a careful abstract of Golden's fine paper on abnormalities of the small intestine in nutritional diseases and a report on 15 cases of megacolon successfully treated by acetylbetamethylcholine.

Dr. Kaplan, in his introduction to the section on radiotherapeutics, laments the disruption of research work in Europe and believes that dominance in scientific achievement (especially in radiology) has shifted to the United States. His selection of abstracts on radiation biology and cancer is excellent and his editorial comments reveal his wide experience. There are two important papers by Robinson and Lecutia on the results of million volt therapy as compared with the usual 200 kV therapy.

Psychotherapy

LEWELLYS F. BARKER, M.D., emeritus professor of medicine, Johns Hopkins University. London: D. Appleton Century Co. Pp. 217. 8*s.* 6*d.*

THIS book begins with a description of psychiatric case-taking after which a plan of adequate treatment is discussed. Somewhat arbitrary statements crop up; for example we are told that a patient with anxiety and marital disharmony, who took alcohol to drown his sorrows, should "correct the faulty habits at once . . . and become a total abstainer." Such advice almost suggests the work of a conscientious and humourless amateur, and the chief defect of the book lies in the author's inability to weigh up the relative resistances which are to be met with in anything so variable and unstable as neurotic patients. All methods of treatment are given a carefully considered description, but of so superficial a kind as to serve as nothing more than a reminder. Short sections on religious miracles, mesmerism, and cures through magic, are discussed alongside methods of group analysis, persuasion and suggestion. It is also a little startling to find descriptions, in a few lines, of delirium tremens and uræmic delirium in a volume on psychotherapy. The value of the work lies in its survey, in brief space, of many methods and schools of thought which are apt to be neglected. The list of works available and consulted with which the book concludes is commendably thorough.

2. Sollman, T. Manual of Pharmacology, Philadelphia, 1936, p. 737.

Housing for Health

C. E. A. WINSLOW, Dr.P.H., chairman of committee on hygiene of housing, American Public Health Association. Pennsylvania: Science Press Printing Co. Pp. 221. $1.00.

THIS book answers the question "What has housing to do with health?" in an interesting, clear and factual way. To gain full value of the dozen papers on the sociological aspects of housing which it contains, the appendix should be read first. Here thirty basic principles of healthy housing are defined, ranging from fundamental physiological and psychological needs to protection against disease and accident. The papers are based on social surveys of American cities; statistical surveys make it evident that poverty is the primary cause of slums. Experience has shown that unless slum dwellers are rehoused in dwellings of a minimum standard at rents which they can afford (through housing subsidies) slum-clearance is merely slum-shifting.

Some of the factors—such as temperature regulation, ventilation and plumbing—might be regarded as the province and responsibility of the architect; but it seems these physical factors have a considerable effect on the habits of the family occupying a dwelling. "The design or building of every house is an act of social importance. It influences the future trend of family life. By force of material environment, it presses family life into one shape or another." Thus the architect, because he is concerned chiefly with technical consideration, should not alone decide the character of home. Homes are places that are lived in, yet too often they are designed as boxes with standard subdivisions labelled living-room, bed-room and kitchen, without any reference to the habits and conditions of the family who are going to occupy them. A group of workers in Stockholm, sponsored by the Swedish Coöperative Building Society, studied actual habits of 215 families, showing the times spent in each room by the various members of the family and what they did there. The family comments on the convenience or otherwise of the general lay-out, and the relationship of stoves, sinks and cupboards were all noted. The investigators concluded that "the best mechanical equipment in the home will not compensate for mediocre planning."

In America local housing authorities and health departments find it increasingly difficult to know whether health is ancillary to housing, or housing is ancillary to health. Encouraged by public opinion they have created joint committees.

Sex Problems and Youth

THEODORE F. TUCKER. London: George Allen and Unwin. Pp. 120. 5*s.*

THE author of this little book has had a wide experience in dealing with the young and knows how to hold out a helping hand to them without in any way being superior or patronising. The only sexual aberrations dealt with are masturbation and homosexuality, the book having been written primarily for "the normal person who is a bit bothered with all this sex business and wants to get his ideas straightened out." It will certainly be helpful to many, not only to the young themselves, but also to parents and others struggling, often all too blindly, to help them. Mr. Tucker demands high ideals in facing the problems of sex and some will find it difficult to follow him all the way, but as Dr. Harry Roberts says in his foreword, "healthy self-control must be based on a sound philosophy of life and in the cultivation of ideals which are real to us."

Neuroses and Psychoses of War

ALEXANDER FRANK, M.D. Vienna. Sydney: J. H. Down. Pp. 93.

THIS little manual is built on experience of the last war, especially in the Austrian Army, and follows customary lines. The writer, a Roumanian, educated in Vienna and now living in Australia, writes chiefly for doctors who have no special knowledge of psychiatry. The exposition is at times slapdash, and ill-considered statements are rather common—such as "these images may appear in the writings of nervous men atavistically," and "the lack of drinking water and excessive perspiration after marches caused concentration of urea in the blood and predisposed them to sunstroke." But in the main the advice given is sensible, though at some points hardly appropriate to the problems of this war.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 14, 1942

VITAL STATISTICS UNDER WAR

ONE result of the war has been the enforced absence of the Registrar-General's annual stocktaking of the nation's health and well-being as measured by birth-rates and death-rates. His last report relates to the year 1938 and many workers, besides the professional statisticians interested in public health and allied subjects, have felt keenly the loss of data at a time when measures of the population's reactions to favourable and unfavourable factors are especially wanted. Fortunately the Registrar-General has lately found it possible to add to his quarterly return a new table which shows the trend of mortality since 1938 from 36 causes of death of special interest in time of war. A clear summary and discussion of the more important features of this table are given by Dr. PERCY STOCKS on our opening page.

The general mortality has, of course, been affected by bombing, though not to the extent that was expected—some 40,000 deaths in roughly a year is an addition of approximately 10% to the normal death-rate of the country as a whole. Deduction of these and other deaths due to violence gives a measure of the war-time course of fatal disease, and reveals a reasonably satisfactory position. In the first quarter of both 1940 and 1941 mortality was relatively high, but both years had severe winters superimposed on any special war effects. The second quarter of 1940 was normal in its death-rate, while that of 1941 shows a very slight rise. The third and fourth quarters show no significant change except, it is good to note, an unusually low rate in the third quarter of 1941. Underlying this general picture we have on the debit side of the account a decided increase in deaths from respiratory tuberculosis (about 6% in the first year of war, 10% in the second year) and affecting both sexes; an increase in other forms of tuberculosis, mainly tuberculous meningitis, later in appearing but then rising proportionately more than the respiratory type (2·4% increase in the first year and 17·6% in the second year); and the large increase, as in the last war, of mortality from cerebrospinal fever, from which the recorded deaths in each year (mid-1939 to mid-1940, and mid-1940 to mid-1941) were for both sexes approximately four times the pre-war levels. Relating deaths to notifications gives a fatality from this cause in 1940–41 of just over 20% for civilians and less than 10% for non-civilians—a great reduction on the old-time 50–60%. On the other hand, despite the new therapy mortality from pneumonia shows no decline. Like that of bronchitis the pneumonia-rate was doubtless affected by the severe winters and possibly by the effects of air-raid conditions on old people. It is sad to see that, even excluding war casualties the usual annual low record for infant mortality is absent. The first four quarters of the war show an average rise of 2 and the second four an average rise of 6½ in the rate per 1000 live births. There has also been some increase in mortality from pernicious anæmia and a substantial rise in deaths from ulcer of the stomach and duodenum. On the credit side there is a continuous and large decline in deaths from acute rheumatic fever and a distinct fall in mortality due to streptococcal and pyogenic infections—scarlet fever, erysipelas, ear and mastoid disease and appendicitis—and also exophthalmic goitre. Maternal mortality likewise shows a substantial improvement and, more unexpectedly, the incidence of stillbirths has been relatively low. Diabetes so far reveals little change, but in 1914–18 it did not decline until the third year of the war. It is interesting to note the distinct decline in suicide especially among women. In the birth-rate there has been a sudden drop in the third quarter of 1940 and a continued low rate up to the end of the record with an 8–10% reduction in the second and third quarters of 1941. This is a relatively smaller decline than in the comparable period of the last war, when the birth-rate fell by 14% in the third quarter of 1915 and broadly continued with that rate of fall till the third quarter of 1916. A lower birth-rate is inevitable in war and the slightly lower probability of survival in infancy is therefore all the more unfortunate.

Infant mortality and deaths from tuberculosis are looked upon as the best indices of the state of social well-being. So far the increases in these rates are not spectacular; but they warn us to do our utmost to prevent the indirect toll which war exacts.

PHANTOM LIMBS AND DISOWNED BODIES

DISORDERS of perception of the body have hitherto aroused little interest among British neurologists. Head and Holmes[1] introduced the term "body scheme" to describe a plastic model reflecting the body shape and forming a standard by which changes in bodily outline and posture are measured. Apart from this important contribution there has been nothing in English neurological literature to compare with the publications of Anton, Redlich, Bonvicini, Babinski, Pötzl, Schilder, Lhermitte and Nielsen, to mention only a few Continental and American workers in this field. This is all the more surprising because disordered awareness of a part of the body is by no means rare, and it often gives rise to symptoms which are strange enough to be noteworthy and which also raise questions of great psycho-physiological interest. It is a welcome coincidence, therefore, that four British papers bearing on this subject should have been published almost simultaneously. Riddoch[2] reminds us that knowledge of the phantom limb—the persistence in consciousness of a limb which has been removed—must be as old as survival from amputation; Lord Nelson considered that the phantom fingers of his amputated arm provided "a direct proof of the existence of the soul." The patient with a painless phantom limb often feels as if he can move it, especially its peripheral segments. When a phantom limb is the site of pain, however, this capacity for hallucinatory movement is usually absent. If the stump is deprived of postural sensibility, for example by surgical division of plexus or roots, the phantom feels as if detached from the stump when this is actively or passively moved. It becomes, in Riddoch's words, "in part a foreign body which cannot be got rid off." In time a painless phantom

1. Head, H. and Holmes, G. *Brain*, 1911–12, **34**, 102.
2. Riddoch, G. *Ibid*, 1941, **64**, 197.

slowly shortens and usually disappears by shrinking into the stump. A painful phantom, on the other hand, survives as long as the pain persists. Parts of the body other than limbs may survive in consciousness after their removal, such as the nose, breast and penis. But in order that a phantom should be experienced it is not necessary that the limb should be removed. If the sensory pathways conveying postural sensibility are interrupted at any point between a limb and the cerebral cortex, the patient may become aware of a phantom limb which seems to occupy quite a different position in space from that which vision shows to be the actual position, the illusory limb thus duplicating the real one. These and other facts lead Riddoch to the conclusion that the recognition of body shape and changing posture is achieved through the activity of physiological mechanisms by means of which three main "plastic models" are constructed. One is derived from postural sensibility, and this model is especially intimately related to voluntary movement. The second, which is contributed by sensations of touch, pain and temperature, makes us aware of the surface of the body and its shape: and the third is the product of vision. A phantom limb is the outcome of the persistence of postural and surface models largely unchanged, in spite of the removal of the limb which they represent.

Spillane's [3] first patient and the patient reported by Parkes Weber [4] showed a defect which at first sight might be regarded as the opposite of a phantom limb. Each denied his hemiplegia and behaved as though the left half of his body did not belong to him; Parkes Weber's patient denied his blindness also. Barkman's [5] explanation of imperception of hemiplegia, however, would closely relate this symptom to the mode of production of a phantom limb, for he suggests that the patient no longer being aware of the left half of his body fills the gap with his memory of it as it was before his cerebral lesion. When he describes it as normal he is thus describing a phantom half of the body, and he rejects the paralysed real limbs as belonging to someone else. But in some cases the gap remains unfilled and the patient may then forget his left side altogether and behave as though it were absent. Nielsen [6] has reported a patient with an amnesia for the left half of the body, who undressed only the right half and went to bed with the left half partially clothed; and dried only the right half after his bath. He believes [7] that the essential lesion in such cases is one which prevents sensations from the left half of the body from reaching consciousness. Faced with this sensory loss the patient may remember his anæsthetic limbs or forget them; he may have an illusion that they are absent but accept evidence to the contrary; or, despite all proofs, he may adhere to his belief, which then becomes a delusion. It seems probable that imperception of hemiplegia is the outcome of a lesion of the optic thalamus, while amnesia for half the body or delusions of its absence depend on destruction of the thalamo-parietal peduncle or possibly the cortex of the supramarginal gyrus, and consequent loss of the postural and surface models of the opposite half of the body.

3. Spillane, J. D. *Lancet*, 1942, i, 42. 4. Weber, F. P. *Ibid*, p. 44.
5. Barkman, A. *Acta med. scand.* 1925, **62**, 235.
6. Nielsen, J. M. *Arch. Neurol. Psychiat., Chicago*, 1938, **39**, 536.
7. Nielsen, *Bull. Los Angeles neur. Soc.* 1938, **3**, 127.

Brain,[8] in a study of visual disorientation, points out that imperception of the body and imperception of external space are closely related, and may be present in the same patient. He describes two main forms of visual disorientation, one in which the patient fails to recognise the spatial relations of objects seen in one half of space, the other a more profound disturbance in which he forgets or neglects one half of external space altogether, just as one half of the body may be forgotten. Brain reports patients who felt as though one side of the body were on the other side, and who were unable to dress themselves because the disintegration of their body schemes impaired their perception of the structure of their clothes. Pineas [9] has reported a case which constitutes a link between unawareness of the left half of the body and unawareness of the left half of space. His patient failed to perceive not only the left half of his own body but also, though he was not hemianopic, the left half of external space and of the persons, objects and pictures which he saw.

It will have been noted that in the cases of imperception of hemiplegia here mentioned the hemiplegia has always been on the left side: imperception of right hemiplegia seems to be unknown in right-handed people, though Olsen and Ruby [10] have reported it in a left-handed patient. As Nielsen has pointed out, the effect of a parietal lesion on the body scheme differs according to whether the right or left hemisphere is involved. In a right-handed person a lesion of the left parietal lobe leads to the appearance of one or more of the components of Gerstmann's syndrome—finger agnosia, failure to discriminate right and left, acalculia and agraphia—while a lesion of the same area of the right hemisphere produces one of the forms of agnosia for the left half of the body already described. The explanation of this difference is unknown, but it is paralleled in the sphere of visual perception, where imperception of one half of external space is probably similarly limited to the left half, and results from lesions of the right hemisphere only. Clearly much remains to be learned about hemisphere dominance and its implications, and as Brain says the problem is complicated by the fact that in left-handedness there is not necessarily a wholesale shift of cerebral functions from one hemisphere to the other. It has been shown that at least five principal functions behave independently of one another in respect of cerebral dominance, and a shift from left to right in the case of one does not necessarily imply a transfer of the others.

We take our bodies so much for granted that we find it surprising that a man should forget the existence of half of his body without missing it, or maintain that his arm or leg belongs to someone else. To be doubtful of one's own body might well seem evidence of insanity. "I will not swear these are my hands: let's see; I feel this pin prick," cries the distracted Lear, anticipating the neurologist. And Descartes, the author of "Cogito, ergo sum," seems to have found the awareness of his body even better evidence of his existence than cogitation, for in his first "Meditation," he wrote: "How could I deny that these hands and this body are mine, were

8. Brain, W. R. *Brain*, 1941, **64**, 244.
9. Pineas, H. *Zschr. ges. Neurol. Psychiat.* 1931, **133**, 180.
10. Olsen, C. W. and Ruby, C. *Arch. Neurol. Psychiat., Chicago*, 1941, **46**, 340.

it not perhaps that I compare myself to certain persons, devoid of sense . . . But they are mad, and I should not be any less insane were I to follow examples so extravagant." It is true that disorders of the body image possess an importance for psychiatry which is far from fully explored. Hysterical paralysis and anæsthesia, depersonalisation, hypochondriasis, and the somatic delusions of melancholia, to mention only a few examples, all imply a disturbance of the body scheme or of ideas derived from it. But the reported cases of imperception of the body have not been gathered from among the insane, and though to deny the existence of a part of the body may be to express a delusion it is quite compatible with rationality in most other respects. These agnosias for the body and for its loss of function are primarily important to the study of the psychology and philosophy of perception. They seem to show that from the perceptual standpoint the body is merely a portion of space which for various reasons we know more directly than we can know the rest, but that our knowledge of the body is not different in kind from our knowledge of the external world. Science, hitherto, has been mainly concerned with enlarging our knowledge of the external world, and in dealing with the body it has sought to apply to it those principles and methods which have succeeded so well outside it. Scientists, however, are beginning to wonder whether some "laws of nature" may not be, as Kant suggested, merely our ways of looking at things. If so, we may find that disorders of the body image have something to teach us about our perception of external space and of those structures within it which, significantly, we call other bodies.

ANTIHORMONES

IF animals are given repeated injections of certain hormone preparations, especially anterior pituitary extracts, they may become insensitive to the physiological action of the hormones. COLLIP and ANDERSON [1] in 1934 demonstrated that this refractory state depends on the presence in the animals' serum of inhibitory substances which they called antihormones. This finding opened an important field which has been entered enthusiastically by research workers in all parts of the world, but the main subject of controversy remains as it was in 1934: are antihormones antibodies in an immunological sense or are they antagonistic hormones? Each side has its supporters, and experimental evidence has been brought forward to support both,[2] but the strongest evidence supports the view that antihormones are true antibodies. Thus antihormones can be precipitated in the globulin fraction of the "antiserum," [3] and their experimental formation in animals depends on an intact reticulo-endothelial system [4] whereas the state of the endocrine glands bears little or no relation to their formation. Furthermore, like the antibodies evoked by animal blood or tissue antigens, antihormones evoked by hormone extracts during a short course of immunising injections have mostly shown well-marked species specificity. In other words, the antihormone will inhibit the action of the hormone extract which has been used to stimulate its formation, but not similar extracts from different animal species.

The final proof that antihormones are true antibodies will depend on the demonstration of a visible in-vitro reaction of the antihormone with the hormone (antigen) which has stimulated its formation. The work of CLUTTON, HARINGTON and YUILL, [5] demonstrates that a substance physiologically active as a hormone (thyroxine), when artificially combined with an antigen such as serum-globulin, can determine the specificity of the precipitating antibody which the artificial antigen evokes—i.e., thyroxine in an artificially conjugated antigen can act as a haptene. But hitherto it has been impossible to demonstrate an in-vitro reaction between a naturally occurring hormone and its antihormone. It may be that the antihormone, as SULMAN [6] suggests, will prove to be an antibody of unusual type which does not react in the test-tube in a manner at present familiar to immunologists; or natural hormones may be coupled with carrier antigens in which the hormone itself is not the haptene. In the latter case it is probable that the carrier antigen may be found not only in the endocrine gland from which a particular hormone extract is prepared but also in similarly prepared extracts from other tissues of the same animal species. Such tissue extracts which in themselves contain no hormone could then be used to absorb antihormones from antisera. Antibody absorption tests, however, present technical difficulties. One is to prevent the antihormone from being carried down non-specifically in a precipitate in whose formation it has played no part. Unless this difficulty is overcome the interpretation of results of absorption tests, especially when antihormone has been removed only partially, may be almost impossible. Many experiments on these lines have been performed, usually with negative or inconclusive results, with a view to establishing that hormones exist in combination with carrier antigens. SINGER [7] has shown that an extract from normal kidney prepared by a method identical with that used in the manufacture of an extract of pituitary gland containing follicle stimulating hormone (FSH) is capable of precipitating most of the antihormone from an antiserum to FSH. His results require confirmation by more carefully controlled biological tests on groups of animals sufficiently large to give statistically significant results. Many attempts have been made to establish the antibody nature of antihormones by correlating the power of reaction in vitro with biological inhibitory power of antihormone sera, but the results have often been contradictory, and so far no definite proof has been obtained. STRANGEWAYS [8] and later BISCHOFF and LYONS [9] have, however, provided evidence which suggests that "antiprolactin" can be specifically precipitated from corresponding antihormone sera.

Although the controversy over the nature of antihormones will probably require for its final settlement chemically and antigenically pure hormone preparations, much valuable work can be done with the extracts now available. Immunological studies such as SINGER'S are useful in determining the antigenic

1. Collip, J. B. and Anderson, E. M. *Lancet*, 1934, i, 76.
2. See Collip, Selye, H. and Thomson, D. L. *Biol. Rev.* 1940, **15**, 1; Thomson, *Physiol. Rev.* 1941, **21**, 588.
3. Harington, C. R. and Rowlands, I. W. *Biochem. J.* 1937, **31**, 2049.
4. Gordon, A. S., Kleinberg, W. and Charipper, H. *Proc. Soc. exp. Biol., N.Y.* 1937, **36**, 484.
5. Clutton, R. F., Harington and Yuill, M. E. *Biochem. J.* 1938, **32**, 1119.
6. Sulman, F. *Arch. int. Pharmacodyn*, 1939, **61**, 319.
7. Singer, E. *Aust. J. exp. Biol. med. Sci.* 1941, **19**, 125.
8. Strangeways, T. S. P. *J. Physiol.* 1938, **93**, 47P.
9. Bischoff, H. W. and Lyons, W. R. *Endocrinology*, 1939, **25**, 17.

composition of extracts from endocrine glands and their relationship to similar extracts of other organs from the same species. But extreme care is needed in the interpretation of results, and we cannot regard an in-vitro antigen-antibody reaction as one in which the hormone itself is participating unless adequate biological tests are performed at the same time.

Annotations

JUST THE PLACE FOR AN ACCIDENT

THE first annual report, covering nine months' activity, of the Birmingham Accident Hospital shows how well imagined the project was. Accidents happen even more freely in war-time, when industry is working at pressure, than in peace-time; and the new hospital, in spite of being obliged to restrict its numbers, has experienced a wide and increasing demand for its services. During the past two years, in the Birmingham area, industrial injuries needing hospital care have increased by 40%, the total now being well over 10,000 cases yearly. Since last April—when the Birmingham United Hospital handed over the Queen's Hospital together with its equipment to become the new Accident Hospital—all the patients admitted have been injured either in industry or road accidents. The hospital is also helping to maintain the health of the worker inside the factory. Courses have been arranged to train industrial medical officers, industrial nurses and ambulance-room attendants, and a special mobile surgical unit, staffed by nurses and doctors from the hospital, is to be kept ready to go at once to the scene of an accident. The unit will be housed in a six-wheeled coach which is now being built. It is divided into three compartments, the main one being fitted up to deal with surgical emergencies, and is a gift of the Austin Motor Company. Apart from this, industry has already contributed £10,000 to the hospital funds. Inside the building 189 beds are in use, and a further 50 are reserved for air-raid casualties. The Ministry of Health has made a further 200 beds available at the EMS hospital at Hollymoor. The outpatient department is being rebuilt and freshly equipped and should be complete by May. Writing of plans for development, Mr. William Gissane, director and surgeon-in-chief, forecasts close contact with medical officers in industry over the treatment and rehabilitation of the injured. An industrial liaison officer is to be appointed to the hospital staff to keep in touch with the accident centres of factories and their needs. Meetings to discuss case-records will be held between industrial medical officers and the hospital staff, by which it is hoped to make advances in the prevention and treatment of accidents. As a teaching centre for undergraduates and post-graduates the hospital will be linked closely with Birmingham University and with the United Hospital. Rehabilitation is regarded as an essential part of treatment, and when fully developed this side of the work will give the patient opportunities for supervised physical activity, gymnastic exercises and swimming. Occupational therapy will include weaving, carpentry and the other handicrafts which have proved engaging enough to keep the patient interested while his needy muscles are unconsciously exercised. Recreational therapy includes team games, which can do much to overcome the boredom of the convalescent. A vocational training centre may be added to the rehabilitation department, if it turns out to be needed; but, as Mr. Gissane points out, a few vocational training centres scattered through the country could serve all the accident centres. If vocational training becomes necessary in Birmingham, however, one large firm has already offered to coöperate in providing it. No doubt a special accident hospital will serve admirably the needs of a highly industrialised community like Birmingham and will be an example to the rest of the country as to what can be done against custom. But instead of adapting special hospitals for accidents in comparable industrial areas it will probably be more practicable and economical to open industrial departments in the existing teaching hospitals and to staff them with physicians and surgeons experienced in the health problems and conditions of industry. In concentrating on industrial traumatic surgery there seems to be a danger of minimising the importance of the purely medical aspects of industrial medicine, which include the less dramatic—but equally crippling to the workers' earning power—occupational skin lesions, infections, poisonings by the metals and organic solvents, and states of mental and physical fatigue. It has been said that one serious objection to special hospitals is that they deprive the teaching hospitals of valuable clinical material; even if medical students have the right of entry into the special hospitals it is more convenient for everybody to have all teaching departments within the same close and curtilage. These considerations apart, Birmingham is to be congratulated on the realisation of a novel idea.

"MARCH" HÆMOGLOBINURIA

AFTER brisk or prolonged exercise some people pass urine containing free hæmoglobin. This phenomenon was first noticed in soldiers after rapid marching and about 30 cases have now been described. Several suggestions have been made to explain it, the most popular being local renal hæmorrhages. Gilligan and Blumgart[1] have thoroughly investigated 3 cases and have shown that the mechanism of this form of hæmoglobinuria is exactly the same as in others[2]—i.e., it is secondary to the presence of an increased amount of free hæmoglobin in the plasma. But whereas the normal person does not pass hæmoglobin in the urine until the plasma hæmoglobin exceeds 100–140 mg. per 100 c.cm. the leak point in these people was reached at a much lower level—about 25 mg. per 100 c.cm.—and when hæmoglobin solution was injected intravenously their leak point was similarly low even at rest. The total amount of blood lost was small, not exceeding the amount of red cells in 40 c.cm. of blood, and the destruction of this blood was entirely intravascular. No evidence of chronic recurrent blood destruction or of impaired renal function was found. Exercise was the prime factor causing this hæmoglobinuria; in one case a brisk walk produced it, in others fast runs were needed. Gilligan and Blumgart agree with previous investigators that posture has something to do with this syndrome, but were not able to define clearly how its influence is exerted; in one of their patients the hæmoglobinuria could be prevented by wearing a plaster jacket which kept him in a moderately kyphotic position. They incline to the view that a certain amount of excess destruction of red blood-cells is a physiological accompaniment of brisk exercise. The people who have hæmoglobinuria are abnormal in one, or possibly two, ways: they have a low renal threshold for hæmoglobin, and relatively mild exercise provokes a significant destruction of red cells with consequent hæmoglobinæmia.

The differential diagnosis of march hæmoglobinuria is important since some of the other paroxysmal hæmoglobinurias are serious. The syphilitic type associated with chilling is detected by the positive Donath-Landsteiner and Wassermann reactions. The nocturnal hæmoglobinuria (Marchiafava-Micheli syndrome) is accompanied by a chronic hæmolytic anæmia and the red blood-cells can be shown to be hæmolysed by the patient's own serum in vitro. This can most easily be done by suspending the patient's washed red cells in

1. Gilligan, D. R. and Blumgart, H. L. *Medicine, Baltimore*, 1941, 20, 341.
2. See *Lancet*, 1941, i, 667.

slightly acidified serum or heparinised plasma either from the patient or from a normal person of the same group, and incubating at 37° C. In myoglobinuria the urine is coloured red; the patient has chills, muscular weakness, stiffness and paralysis; the colour is due to the muscle pigment myoglobin. It has been suggested that march hæmoglobinuria might be really of this type, but spectrophotometric measurements have now enabled myoglobin and hæmoglobin in urine to be distinguished and there is no doubt that the red urine of exercise is due to hæmoglobin; true myoglobinuria is very rare. Another odd hæmoglobinuria, due to eating broad beans,[3] is not likely to occur here. The fact that ingestion of beetroot, and, among the drugs, amidopyrine, phenolphthalein and 'Prontonsil Rubrum' may also colour the urine red should be remembered. Hæmaturia is, of course, excluded by the microscopic examination for red cells in the urine.

The condition appears to be benign and spontaneous recovery occurs in a few months or a few years, but since we do not know the effect of frequent passage of hæmoglobin on the kidney it seems advisable for the patient to avoid exercise that leads to hæmoglobinuria, and if this causes serious interference with ordinary life arrangements should be made to keep the urine alkaline during the periods when hæmoglobinuria might be expected. Many people of both sexes are now undergoing vigorous physical exercise under close observation, so that cases of this form of hæmoglobinuria are likely to be detected. All the cases so far described have been in men, usually soldiers or athletes, but since the condition is symptomless it is possible that this sex differentiation may be due to lack of opportunities for observation rather than a true sex limitation; perhaps the medical branch of the women's services will be able to settle the point.

DIAGNOSIS OF ADDISON'S DISEASE

IT is often difficult to decide whether a patient has or has not got Addison's disease, and the clinician gets little help from his colleagues. Told about a case, one's friends have the exasperating habit of producing others from their memory—much as conjurors do rabbits from hats—who were undoubtedly suffering from the disease and who proved it by dying suddenly, but who had remarkably few of the classical signs. The scope of the problem has been enlarged, as Robinson, Power and Kepler [4] point out, by the possibility of vague states of fatigue being treated unnecessarily and expensively with cortical preparations. They have devised a test for the borderline case which they claim is sensitive. It is based on the fact that people with Addison's disease do not respond to a draught of water with a normal diuresis. The reason for this is unknown, and it may not have any direct relationship to the absence of suprarenal hormones. It may be the result of the salt deficiency which is part of the addisonian syndrome, for normal men and animals suffer from the same disability when they have been made salt deficient by experimental means.[5] The test is carried out as follows. After 6 P.M. on the evening preceding the test, the patient takes nothing by mouth till the test begins on the following morning. Urine passed between 10.30 P.M. and 7.30 A.M. is collected and measured and the patient again empties his bladder at 8.30, and between then and 9.15 he is asked to drink 20 c.cm. of water per kilogramme of body-weight. From 9.30 to 12.30 the patient empties his bladder hourly and if the volume of any one of these specimens exceeds the volume passed during the night Addison's disease may be excluded. A second confirmatory test described by Robinson and his colleagues is based on the patient's blood chemistry and the analysis of urines passed during the test already described. The tests are simple and may turn out to be valuable to many besides their authors. The task of drinking 20 c.cm. of water per kilogramme of body-weight (2¼ pints for a 10 stone patient) seems on the face of it a difficult one for many patients with Addison's disease, but in such severe cases the diagnosis would probably be obvious without tests.

3. *Ibid*, ii, 164.
4. Robinson, F. J., Power, M. H. and Kepler, E. J. *Proc. Mayo Clin.* 1941, **16**, 557.
5. Baldes, E. J. and Smirk, F. H. *J. Physiol.* 1934, **82**, 6; 2 McCance, R. A. and Widdowson, E. M. *Ibid*, 1937, **91**, 222; Wilkinson, B. M. and McCance, *Quart. J. exp. Physiol.* 1940, **30**, 249.

MYALGIA AND SUBUNGUAL HÆMORRHAGE

HÆMORRHAGE under the nails, of a rather characteristic "splinter" form, was first recorded in cases of trichiniasis by MacNaught [1] in 1939, and has since been noted by many observers. This hæmorrhage appears at the time the embryos are migrating, and is presumably due to an embryo acting as embolus in a vascular loop in the nail-bed. In this issue Dr. Houghton and Dr. Idris Jones describe a series of cases of myalgia occurring in late 1939, two of which showed hæmorrhages under the lunules of the nails, and in view of the recent increase in the incidence of trichiniasis these might be suspected of representing an early outbreak of that disease. But none of the patients showed an eosinophilia, and skin and precipitin tests to trichinella antigen carried out in April, 1941, were all negative, so a different explanation must be sought. The conditions in which subungual hæmorrhages have been recorded are broadly of two types—scurvy, purpura and blood dyscrasias form the first group, where the hæmorrhages may be diffuse or in the form of small petechiæ and the bleeding is due to increased permeability of vessel walls; the second comprises conditions such as infective endocarditis and trichiniasis where the hæmorrhages are embolic in origin. Pardo-Castello [2] in his monograph on diseases of the nails also mentions subungual hæmorrhages as having been seen in tetany and postencephalitic parkinsonism, in old age, and very rarely in apparently healthy people and as a form of vicarious menstruation, but he peculiarly omits trichiniasis even in the 1941 edition. The hæmorrhages in the cases described by Houghton and Idris Jones seem to have been purpuric rather than embolic, for other manifestations which may be purpuric were noted in two of the cases—epistaxis in one and bleeding from the cuticle of the nails in another. The ætiology of these new cases of myalgia is obscure, but the tentative suggestion is made that they are due to an unknown virus infection. None of them had the peculiar stiffness of the affected muscles, the gastro-intestinal symptoms, eosinophilia and swollen eyelids which are characteristic of trichiniasis, so that the two conditions could be distinguished apart from specific tests. The series has established that the association of myalgia with subungual hæmorrhages does not always mean trichiniasis.

A CHOLAGOGUE FROM CURCUMA

MANY substances have been credited with a power to stimulate the flow of bile but probably few of these reputed cholagogues are true choleretics—that is, substances which increase the amount of bile secreted by the liver. It is difficult to determine whether a drug actually increases the amount of bile entering the gall-bladder. The rationale for the therapeutic employment of choleretics and hydrocholeretics (substances which increase the volume of the bile) is somewhat obscure, but when such an action is desired bile itself or preparations of bile acids are the most effective agents. They have been used in different types of hepatic disorder—in diseases of the biliary tract, and, in conjunction with substances which will relax the sphincter of Oddi, to remove small calculi from the common bile-duct. The bile salts have been employed for outlining the bile-ducts at operation and in cholecystography with tetriodophenolphthalein to accelerate the appearance of the gall-

1. MacNaught, J. B. *Amer. J. trop. Med.* 1939, **19**, 181.
2. Pardo-Castello, V. Diseases of the Nails, Springfield, 1941.

bladder shadow and hasten the removal of the residual contrast medium. For such purposes the substance known as dehydrocholic acid, which is 3,7,12,triketocholanic acid, an oxidation product of cholic acid, may be given by mouth or its sodium salt may be injected intravenously when a rapid action is required. Turmeric, the dried rhizome of *Curcuma domestica* Val. (Fam. Zingiberaceæ) and other species is better known as a constituent of curry powders and other condiments than as an item in the materia medica, but it has long been used by natives in India for the treatment of jaundice and there were references to its therapeutic use in 1748 and 1867, while from 1927 onward a number of papers appeared on the use of extracts of the plant or of curcumin, the yellow pigment it contains, for the treatment of disorders of the liver and biliary tract. Oppenheimer [1] used sodium curcumin by mouth and intravenous injection and found that 10 c.cm. of a 5% solution produced rapid emptying of the gall-bladder which was clearly demonstrable on cholecystograms, the gall-bladder being considerably reduced in size in 10–20 minutes after injection. This effect, however, was not constant in all cases, but he concluded from his observations and those of Henning and Künzel [2] that its action is choleretic, with emptying of the gall-bladder as a frequent effect in addition to the increased secretion of bile. He used curcumin, chiefly given by mouth, with calcium cholate, in 67 patients suffering from subacute, recurrent or chronic cholecystitis, with relief of symptoms during the periods throughout which the patients were observed. Perhaps in these days when eggs and fats are short curried dishes would provide an effective substitute for emptying the gall-bladder during cholecystography. In addition to the yellow crystalline body curcumin, turmeric also contains about 5% of a volatile oil, and while the choleretic and cholagogue action of turmeric has been attributed by most investigators to the curcumin, Siebert [3] has shown by animal experiments that a like activity is possessed by *p*-tolylmethyl-carbinol, a constituent of the essential oil of *Curcuma domestica*. He has used a synthetic derivative of this compound, the diethanolamine salt of *p*-tolylmethyl-carbinol camphoric ester, by intramuscular injection in man and investigated by means of a duodenal tube the increase in secretion. He found that the effect persisted for about an hour after injection and the average increase in secretion was 439% above the normal, the greatest rise observed being 679%. Siebert claims from this investigation that this synthetic substance provides an exceptionally powerful cholagogue which is suitable for therapeutic use.

PNEUMOMEDIASTINUM IN THE NEWBORN

AN alarming variety of respiratory failure in the newborn is described by Gumbiner and M. M. Cutler [4] of Chicago as due to the presence of air under pressure in the mediastinum. The condition occurs during the first days of life and shows itself by respiratory and circulatory distress. The respirations become rapid and shallow and cyanosis appears. The peripheral veins, especially in the neck, are distended. The heart sounds are feeble and distant and there may be superficial crackling sounds, synchronous with the heart beat. Bulging of the præcordium may be seen and the cardiac dullness is obliterated. Occasionally spontaneous rupture of the mediastinal "air block" takes place and a pneumothorax or subcutaneous emphysema may then develop. The term "air block" was suggested by Macklin, whose views on this condition are quoted by Gumbiner and Cutler. Experimental work has shown that overdistension of a portion of lung leads to rupture of the alveoli and escape of air along the vascular sheaths to the mediastinum. The air in the mediastinum produces changes as soon as the pressure reaches zero. The heart, great vessels, trachea, bronchi, lungs and vago-sympathetic plexus all may be affected. At first respirations become rapid and shallow. Next comes a drop in blood-pressure, followed by pressure on the veins with a diminished flow of blood into the auricles. The early dyspnœa is apparently of circulatory origin. Pressure on the trachea, bronchi and lungs comes later and appears to be a relatively small factor. The heart is displaced downwards and the percussion note becomes resonant and even tympanitic. Thus pneumomediastinum may be suspected clinically but the diagnosis is definitely established by X-ray examination. The normal anterior-posterior view may show air just outside the borders of the mediastinum but the lateral view shows characteristic pools of air just below the shadow of the sternum. In mild cases the air is absorbed and all that is required is the administration of oxygen if respiratory difficulty is present. But if the encapsulated air begins to cause pressure symptoms, aspiration is indicated. Gumbiner and Cutler report a case in which this was successfully carried out in an infant aged three days whose condition had become critical, with a lateral X-ray picture showing pneumomediastinum. A needle was inserted into the third left interspace 1 cm. from the sternal margin and directed medially. A gush of air into the attached syringe moved the plunger back to the 6 c.cm. mark, indicating the release of air under pressure. Within five minutes there was a drastic change in the infant's appearance, and within three days he was clinically normal with normal X-ray appearances in the chest. Pneumomediastinum is probably not common, although after their dramatic therapeutic success Gumbiner and Cutler encountered 3 further cases in the succeeding eight months. It is so obviously amenable to treatment that the possibility of its presence should be remembered when an infant develops acute respiratory distress in the early days of life.

1. Oppenheimer, A. *Lancet*, 1937, i, 619.
2. Henning, N. and Künzel, O. *Münch. med. Wschr.* 1934, **81**, 1611.
3. Siebert, W. *Deutsch. med. Wschr.* 1941, **67**, 679.
4. Gumbiner, B. and Cutler, M. M. *J. Amer. med. Ass.* 1941, **117**, 2050.

THE theme of a new report [1] by the industrial health research board of the Medical Research Council has truth not novelty to recommend it. Time-keeping in factories, they find, could be improved by reasonable hours, better transport and catering facilities, and more attention to the domestic problems of married women. Their findings are based on investigations covering 50 factories and 200,000 workers. The usual facts about hours of work have become evident: time lost by workers through sickness, injury and absence was usually low when hours were less than 60 a week, but increased as the hours increased up to 75. The board suggest that weekly hours should not exceed 60–65 for men and 55–60 for women, that holidays should be staggered, and that factory records should be kept more systematically.

1. H.M. Stationery Office. 6*d*.

DIETS FOR DYSPEPTICS.—Many workers with peptic ulcers live alone or in rooms where the trouble necessary to provide their special dishes is not likely to be taken, as for example the sieving of vegetables, and it has been lately suggested in Edinburgh that British Restaurants should provide suitable meals for them at a reasonable cost. Some hospital patients can afford to pay 1*s*. 6*d*. for a meal but a charge of 1*s*. or 1*s*. 2*d*. would make the meals available to many more. Provision for dyspeptics is important in war-time, for only with proper feeding can they hold their jobs.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—At a meeting of the college held on Feb. 3, with Dr. Charles McNeil, the president, in the chair, the following were introduced and took their seat as fellows: Dr. James Lockhart Cowan (Penicuik, Midlothian), Lieut.-Colonel Alexander Dron Stewart (Edinburgh), Dr. Alexander Joe (Edinburgh) and Dr. John Bishop Borthwick (Edinburgh).

MICRO-CHEMICAL METHODS OF BLOOD ANALYSIS

REVISED AND EXTENDED

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A DESCRIPTION of procedures for micro-analysis of certain commonly determined blood constituents was given in a former communication (King et al. 1937). Some of the procedures have since been modified, and micro-methods for other blood constituents have been investigated. The improvements introduced are outlined here and directions are given for additional methods. The sections are numbered throughout to correspond with those in our previous paper.

(A) PROCEDURES FOR WHOLE BLOOD

Sections I, II, III and VII are modifications of previously described procedures.

I. *Urea.*—A Klett violet-light filter is used for the colorimetric comparison (from Messrs. Hearson).

II. *Non-protein nitrogen.*—The blood is deproteinised with 0·3 c.cm. of 10% sodium tungstate and 0·3 c.cm. of $\frac{2}{3}$ N sulphuric acid instead of 0·6 c.cm. of trichloracetic acid.

III. *Inorganic phosphate.*—The reducing agent may be prepared fresh for use from a tablet containing the correct amounts of 1 : 2 : 4-aminonaphthol-sulphonic acid, sodium sulphite and sodium metabisulphite. A tablet is ground with 10 c.cm. of water, filtered, and the solution is ready for use (from Messrs. Gallenkamp).

VII. *Glucose.*—The blood (0·2 c.cm.) is collected in a mixture of 3·2 c.cm. of 3% sodium sulphate and 0·3 c.cm. of 7% copper sulphate (copper prevents loss of sugar by glycolysis), and is deproteinised by adding 0·3 c.cm. of 10% sodium tungstate when ready for analysis.

Colorimetric method for glucose (on 0·05 c.cm. blood).—See Haslewood and Strookman (1939).

VIII. *Galactose.*—See King and Aitken (1940).

IX. Sulphonamides in Blood

Sulphanilamide appears in the blood in variable amount after administration. Part of it is present in the free state and part in a conjugated form. For therapeutic purposes it is usual to try to adjust the amount administered by mouth so as to maintain a level of 8–15 mg. of the free sulphanilamide per 100 c.cm. of blood. The total sulphanilamide (i.e., free plus conjugated) is usually 20–50% more than the free.

PRINCIPLE

The blood is deproteinised with trichloroacetic acid. Sulphanilamide is estimated in the filtrate by means of the diazo reaction. The sulphanilamide is diazotised with sodium nitrite, the excess nitrite is destroyed by ammonium sulphamate, and the diazonium compound is coupled with naphthyl ethylene diamine. The pink colour produced is compared with that developed from a standard sulphanilamide solution treated in the same way. The conjugated sulphanilamide must be released from its organic combination before it will react with the reagents. This is accomplished by boiling the trichloroacetic acid filtrate with hydrochloric acid. Determination of the sulphanilamide in the resultant solution gives the total sulphanilamide, free plus conjugated.

The chemically related drugs, sulphapyridine and sulphathiazole, are determined in the same way.

METHOD

This method is adapted from the procedure of Marshall (1939), 0·2 c.cm. of blood is added to 3·2 c.cm. of water or isotonic sodium sulphate; 0·6 c.cm. of 25% trichloroacetic acid is added. The mixture is vigorously shaken, and filtered or centrifuged; 2 c.cm. of the filtrate (= 0·1 c.cm. of blood) is transferred to a test-tube and 1 drop of sodium nitrite solution added. The tube is shaken and left for 3 min.; 1 c.cm. of ammonium sulphamate solution is added and the mixture left for 2 min. with occasional shaking. 2 c.cm. of naphthyl ethylene diamine solution is now added and the mixture shaken. The coloured solution is compared with a standard prepared in the same way from 2 c.cm. of standard solution (= 0·004 mg. sulphanilamide). The use of a yellow-green light filter (e.g. Ilford spectral yellow-green) facilitates the comparison.

Total sulphanilamide is determined by heating 2 c.cm. of filtrate with 0·5 c.cm. of N hydrochloric acid in a 5 c.cm. volumetric flask in a boiling water-bath for 1 hour. The cooled contents of the flask are then treated with sodium nitrite, &c. as in the procedure for free sulphanilamide, and the volume adjusted to 5 c.cm. with water.

CALCULATION

$$\text{Blood sulphanilamide (mg. per 100 c.cm. blood)} \begin{cases} \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0{\cdot}004 \times \dfrac{100}{0{\cdot}1} \\ \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 4 \end{cases}$$

If the colour of the test is more than twice as strong as that of the standard, the determination should be repeated with 1 c.cm. of filtrate plus 1 c.cm. of water.

If sulphapyridine or sulphathiazole is determined by the above procedure, and with a sulphanilamide standard, the value obtained is multiplied by 1·4 to give the mg. sulphapyridine or sulphathiazole per 100 c.cm. blood.

SOLUTIONS

25% *trichloroacetic acid.*—25 g. of the acid dissolved in water and made up to 100 c.cm.

Sodium nitrite solution.—0·5 g. dissolved in 100 c.cm. of water. This solution is the same as solution B in the bilirubin method.

Ammonium sulphamate solution.—0·5 g. dissolved in water and made up to 100 c.cm.

Naphthyl ethylene diamine solution.—0·5 g. of N (1-naphthyl) ethylene diamine dihydrochloride in 100 c.cm. of water; stored in a brown bottle.

Stock standard sulphanilamide (0·1 mg. per c.cm.).—100 mg. of sulphanilamide is dissolved in 1 litre of water.

Standard solution (0·002 mg. sulphanilamide per c.cm.).—2 c.cm. of the stock standard, together with 15 c.cm. of the 25% trichloroacetic acid, is diluted to 100 c.cm. with water.

(B) PROCEDURES FOR PLASMA

I. Plasma Proteins *

It has been shown by Campbell and Hanna (1937) that treatment of plasma with sodium sulphite, instead of sodium sulphate, solution enables the globulin fraction to be precipitated in 10 minutes (instead of 3 hours) and at room temperature (instead of at 37° C.). This method, modified for use with 0·2 c.cm. of plasma, has been found, with bloods containing normal and abnormal ratios of albumin and globulin, to give results almost identical with those obtained by the sodium sulphate procedure previously described.

METHOD

(*a*) *Total protein* and (*b*) *fibrin* are estimated as in the previous method with the exception that 0·2 c.cm. of 50% sulphuric acid (approximately 18 N) is used for the digestion instead of 0·5 c.cm. of 30% (see N.P.N.). If the highest accuracy is not necessary in the total protein estimation, the 0·2 c.cm. of diluted plasma may be digested with sulphuric acid, without the preliminary precipitation of the protein with zinc hydroxide. The result obtained will be approximately 0·15% too high. (0·15% protein corresponds to the average non-protein nitrogen equivalent of 24 mg. per 100 c.cm. of normal plasma. This simplification should only be used in cases where the N.P.N. is known not to be elevated.

(*c*) "*Albumin.*"—A drop of caprylic alcohol is added to a 5 c.cm. volumetric flask; 0·2 c.cm. of oxalated plasma is pipetted into the flask and the volume made to 5 c.cm. with sodium sulphite solution. The flask is stoppered, well shaken, and allowed to stand at room

* Modification of previously described procedure.

temperature for 10 min. The solution is filtered through a fine paper. 0·2 c.cm. of the filtrate (= 0·008 c.cm. of plasma) is added to 4 c.cm. of water in a 15 c.cm. conical Pyrex centrifuge tube, and this solution mixed with 0·1 c.cm. of zinc sulphate solution and 0·1 c.cm. of 0·5 N sodium hydroxide. The tube is centrifuged and, when the supernatant liquid has been carefully decanted, inverted and allowed to drain on filter paper. The precipitate is treated with 0·2 c.cm. of 50% sulphuric acid. A piece of porous pot is added and the mixture gently boiled till charring occurs and white fumes appear. To the cooled solution is added 1 drop of hydrogen peroxide (99–100 vol.) and heating is continued for 3 min. After cooling, the clear colourless solution is mixed with 5 c.cm. of water, well mixed, and 3 c.cm. of Nessler's reagent is added. The colour is compared with a standard made by adding 1 c.cm. of Nessler's reagent to a mixture of 2 c.cm. of water and 5 c.cm. of standard ammonium chloride solution (containing 0·01 mg. of nitrogen per c.cm.)

CALCULATION

$$\text{Albumin (g. per 100 c.cm. of plasma)} \begin{cases} = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0{\cdot}05 \times \dfrac{100}{0{\cdot}008} \times \dfrac{6{\cdot}25}{1000} \\ = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0{\cdot}625 \times 6{\cdot}25 \end{cases}$$

SOLUTIONS

Sodium sulphite solution.—42 g. of the salt $Na_2SO_3{\cdot}7H_2O$ dissolved in water, and the volume made to 100 c.cm.

Zinc sulphate and *standard ammonium chloride* as in the method for blood-urea.

III. Plasma Phosphatase †

The buffer substrate is divided into two solutions to ensure greater stability (a slow but appreciable hydrolysis of the phenyl phosphate takes place in the alkaline buffer). The reaction of the hydrolysis mixture (substrate, buffer and plasma) has been made slightly more alkaline (6 Na_2CO_3 : 4 $NaHCO_3$, instead of 5Na_2CO_3 : 5 $NaHCO_3$), bringing the final pH more nearly to the optimum. The amount of hydrolysis is thereby somewhat increased and the values are brought closer to those obtained with the original method (King and Armstrong 1934), in which a veronal buffer was used. The "diluted stock standard phenol" is eliminated, and the "standard phenol-solution-and-reagent" is prepared direct from the "stock standard phenol." The new standard-phenol-solution-and-reagent contains less Folin-Ciocalteau reagent than the former. The concentration of the reagent in the standard is thus made more nearly equal to that in the test, from which a small proportion of the reagent originally added is lost through combination with the precipitated protein.

METHOD

Test.—In a conical centrifuge tube are placed 2 c.cm. of buffer and 2 c.cm. of substrate. The tube is placed in a water-bath at 37° C. for 3 min. Without removal of the tube from the bath, exactly 0·2 c.cm. of plasma (which must be cell-free) is added and mixed. The stoppered tube is allowed to remain in the bath for exactly 15 min. At the end of this time 1·8 c.cm. of dilute Folin-Ciocalteau reagent is added and the mixture centrifuged or filtered.

Control.—In another tube are placed 2 c.cm. of buffer and 2 c.cm. of substrate; 0·2 c.cm. of plasma is added, and at once 1·8 c.cm. of dilute Folin-Ciocalteau reagent, and the mixture centrifuged or filtered.

4 c.cm. of filtrate from the test and control solutions and 4 c.cm. of the standard phenol and reagent (= 0·04 mg. phenol) are pipetted into test-tubes; 1 c.cm. of 20% sodium carbonate is added, and the tubes replaced in the 37° water-bath for 10 min. to allow the colour to develop.

SOLUTIONS

Buffer. M/10 sodium-carbonate-bicarbonate (6 Na_2CO_3 : 4 $NaHCO_3$).—6·36 g. anhydrous sodium carbonate and 3·36 g. sodium bicarbonate are dissolved in distilled water and made to 1 litre.

Substrate. M/100 disodium phenyl phosphate.—2·18 g. dissolved in 1 litre of water. The solution should be brought to the boil to destroy any organisms, cooled and preserved with a little chloroform.

Standard-phenol-and-reagent (1 mg. phenol per 100 c.cm.).—5 c.cm. of the stock standard phenol (100 mg. per 100 c.cm.) is accurately measured into a 500 c.cm. volumetric flask; 100 c.cm. of dilute (1 : 3) Folin-Ciocalteau reagent is added and water to the mark. This solution will keep at least 6 months, if preserved in the ice-chest.

† Modification of previously described procedure.

V. Plasma Sodium

The sodium of the blood is concentrated in the plasma very little being found in the red cells. In normal persons plasma sodium values lie between 325 and 350 mg. per 100 c.cm. In acute cases of Addison's disease the amount is lowered, when values approaching 250 mg. may be encountered; in chronic cases it may be only slightly depressed.

PRINCIPLE

After precipitation of the plasma proteins by trichloroacetic acid the sodium in the filtrate is precipitated as sodium zinc uranyl acetate. After washing, this precipitate is treated with potassium ferrocyanide and the resulting plum red colour (uranyl ferrocyanide) is compared with that produced by a standard sodium chloride solution which has been treated in a similar fashion.

METHOD

This method is adapted from the procedure of Noyons (1939). To 0·5 c.cm. of serum or plasma are added 1·5 c.cm. of 7% trichloroacetic acid. The mixture is shaken well and filtered after 5 min.; 0·2 c.cm. of the filtrate (= 0·05 c.cm. plasma) is transferred to a centrifuge tube containing 1 c.cm. of absolute alcohol and 0·4 c.cm. of zinc uranyl acetate reagent. The contents are mixed and kept in the ice-box overnight ‡; they are then centrifuged for 15 min. The supernatant solution is decanted, the tube allowed to drain on a filter paper for 10 min. and the lip dried; 5 c.cm. of absolute alcohol saturated with sodium zinc uranyl acetate is added; the contents are mixed, by rotating the tube, centrifuged for 15 min. and drained as before. The precipitate is then dissolved by adding 10 c.cm. of dilute acetic acid; 0·25 c.cm. of potassium ferrocyanide solution is added and after mixing the tube is allowed to stand in the dark for 5 min. The coloured solution is compared with that produced from a standard sodium chloride solution, 0·2 c.cm. (= 0·15 mg. Na) of which has been treated simultaneously in the same way as the deproteinised plasma. (Colours must be read within 15 min. or a clouding may occur.)

CALCULATION

$$\text{Plasma sodium (mg. per 100 c.cm. of plasma)} \begin{cases} = \dfrac{\text{Reading of standard}}{\text{Reading of unknown}} \times 0{\cdot}15 \times \dfrac{100}{0{\cdot}05} \\ = \dfrac{\text{Reading of standard}}{\text{Reading of unknown}} \times 300 \end{cases}$$

SOLUTIONS

Standard NaCl (containing 0·75 mg. Na per c.cm.).—191 mg. of analytical dry sodium chloride dissolved in 100 c.cm. in water in a volumetric flask.

Trichloroacetic acid.—7 g. per 100 c.cm. in water.

Zinc uranyl acetate reagent.—20 g. of uranyl acetate, $UO_2(CH_3COO)_2{\cdot}2H_2O$, 60 g. of zinc acetate, $Zn(CH_3COO)_2{\cdot}2H_2O$, and 60 c.cm of glacial acetic acid are added to 320 c.cm. of distilled water and warmed gently until dissolved. After standing 24 hours the solution is filtered into a dark bottle and stored in the ice-box. The solution must be filtered immediately before use.

Saturated alcoholic sodium zinc uranyl acetate.—40 c.cm. of zinc uranyl acetate reagent are mixed with 50 c.cm. of 50% alcohol saturated with sodium chloride; 100 c.cm. of absolute alcohol is added, and, after standing in the ice-box overnight, the supernatant solution is decanted. The precipitate is washed several times with alcohol, drained, dried and then shaken with 500 c.cm. of absolute alcohol. This is stored in the ice-box and filtered immediately before use.

Potassium ferrocyanide.—20 g. dissolved in water and made up to 100 c.cm.

Dilute acetic acid.—0·5 c.cm. glacial acetic acid made up to 100 c.cm. with water.

‡ It is not possible to obtain complete precipitation of the sodium zinc uranyl acetate in a short time. A 2 hr. precipitation may be used, however, although the results will be less accurate.

VI. Serum Potassium

The serum of normal persons contains 16–20 mg. of potassium per 100 c.cm. This is a very constant value. There is a rise in Addison's disease, a small rise during attacks of bronchial asthma and in advanced renal disease, and a fall in familial periodic paralysis during the attacks of paralysis.

PRINCIPLE AND METHOD

The potassium is precipitated as cobalti-nitrite. The precipitate is washed, dissolved in hot water, and an excess of choline hydrochloride and sodium ferrocyanide is added. An emerald green colour develops immediately, the depth of which is proportional to the amount of cobaltous salt present, and hence to the amount of potassium.

This method is adapted from the procedure of Jacobs and Hoffman (1931). 0·5 c.cm. of serum (or of standard potassium solution) is placed in a conical centrifuge tube graduated at 4 c.cm., and 1 c.cm. of filtered Kramer and Tisdall's sodium cobalti-nitrite reagent is added slowly with constant shaking. After 45 min. 1 c.cm. of water is added, and the contents are mixed and centrifuged at moderate speed for 15 min. The tube is then inverted and drained briefly on filter paper; 2 c.cm. of water is added down the sides of the tube without disturbing the precipitate. The tube is again centrifuged for 5 min., inverted and thoroughly drained. The precipitate is washed with 5 c.cm. of 70% alcohol, and centrifuged and drained. The alcohol is blown into the tube so as to agitate the precipitate. 1 c.cm. of water is added and the tube placed in a boiling water-bath until dissolution is complete.

In another graduated centrifuge tube is placed 1 c.cm. of the standard cobalt solution (0·1 mg. potassium); 0·5 c.cm. of choline chloride solution and 0·5 c.cm. of sodium ferrocyanide solution are added in that order to each tube and the volume made to 4 c.cm. The colours can be immediately compared in a colorimeter and are stable for several hours. (Orange or red light filter.)

CALCULATION

$$\text{Serum potassium (mg. per 100 c.cm. serum)} \begin{cases} = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 0{\cdot}1 \times \dfrac{100}{0{\cdot}5} \\ = \dfrac{\text{Reading of standard}}{\text{Reading of test}} \times 20 \end{cases}$$

SOLUTIONS

Sodium cobalti-nitrite reagent (Kramer and Tisdall 1921).—Solution A: 25 g. of cobaltous nitrate crystals is dissolved in 50 c.cm. of water, and to this solution is added 12·5 c.cm of glacial acetic acid. Solution B: 120 g. of sodium nitrite (potassium free) is dissolved in 180 c.cm. of water, giving a total volume of about 220 c.cm. To the whole of A is added 210 c.cm. of B. Nitric oxide is evolved. Air is drawn through the solution till all the gas has passed off. The reagent thus prepared is best kept in the ice-chest and should be filtered each time before use; it keeps for a month.

Standard potassium solution.—0·2228 g. of potassium sulphate (K_2SO_4) is dissolved in 500 c.cm. of water, giving a solution equivalent to 0·2 mg. K per c.cm.

Standard cobalt solution (= 0·1 mg. potassium per c.cm.).—0·506 g. of cobalt ammonium sulphate is dissolved in a litre of water. Any cobalt salt may be used but this is the easiest to weigh. The solution should be standardised against the standard potassium before use, but when once made is stable.

Choline chloride (1 g. per 100 c.cm.).

Sodium ferrocyanide (2 g. per 100 c.cm.).

Because there are only 16–20 mg. potassium per 100 c.cm. of serum, and blood corpuscles contain about 300 mg. per 100 c.cm. there must obviously be no hæmolysis. Also, the serum must be separated from the clot soon after the blood is taken; otherwise potassium will diffuse out into the serum. Separation of serum 1–2 hours after taking the blood is sufficient.

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In England Now

A Running Commentary by Peripatetic Correspondents

GOING on leave last week provided a variety of new experiences, physical and emotional, in which the feeling of a very old Rip Van Winkle returning to a rejuvenated homeland were combined with those of a very young Rip Van Winkle re-entering an impossibly antique land. The journey offered the first excitement. Time not always being on our side, I decided to go by air, and it was not till we were approaching the aerodrome on a bleak, gusty morning that I began to doubt the wisdom of my choice, to hope that the trip would be cancelled, and to yearn for a priority passenger to come and claim my seat. Both these emotions vanished when it appeared that I was not going to be allowed to find the way in. I could see the aerodrome. I could even see the planes dotted on the landing field like camouflaged ducks; but the entrance was something too secret to be divulged. After charging up several alley ways that debouched either into chicken runs or mysterious flat places where builder's mates seemed to be muttering incantations over a pile of cement powder, I landed in a yard at the extreme end of which I saw a sentry box full of sentry. He was obviously torn between the conviction that he should not be answering my questions and a feeling that he would never get rid of me unless he did. It appeared from his uneasy gruntings that the only alley I had rejected, because it headed directly into the front parlour of a private house, was the correct one. By this time I could hear the plane warming up, and frantic at the thought of forfeiting my fare money I tore across what seemed to be a private garden, leapt a decaying flower bed, and whirled round the side of the house into the arms of six or seven surprised mechanics. A tired-looking clerk emerged from nowhere and shepherded me wearily back into the house, now disclosed as an office, where I was received by an amiable but shrewd policeman, who asked me to examine the list on the wall, and then declare anything that might be mentioned on it. I looked, my eyes glued to the two items that seemed to be waving their hands to attract his attention. Honesty fought with guile. "Well I've got nothing in my bag, but I have——" I paused. "My lunch is—well, not quite above suspicion." He looked at the small parcel, he looked at me; two minutes later I was forcing myself into the back seat, the mail was thrown in, the door banged, and we were off. Rocking like a car on a badly-pot-holed road we bumped and swayed, and as our eyrie was completely blacked out waited to tell by sensation when we took the upper air. My main impression as the humming of the engines swelled was that the whole affair had an unpleasant resemblance to going off under gas; the tempo had only to quicken a little more, the swaying to increase to nausea point and oblivion would follow—or would it? I looked at the brown paper objects tucked into the back of the next seat, identified them as bags put there for a sinister purpose, and wondered if I were going to disgrace the passenger list. At that moment the plane seemed to straighten out, the pilot changed into top, and the bumping ceased and did not recur till we slid on to the tarmac at our destination. My first plane journey was over, deliciously uneventful, gratifyingly dull. The rest of the passengers were hardened old travellers who snored and gurgled in unison with the plane. The sole human high light was the wireless operator who sat in front of his switchboard, his fingers intent with his instruments, his eyes equally intent on "Gone with the Wind."

The return journey was just as undramatic, if one excludes the famous gossip writer who sat directly behind me and who I hoped was taking notes on the natty cut of my new raincoat. Stepping out of the plane I made a dash for the shelter of the private-house-cum-office that had so baffled me a week ago. As I cantered up the garden path, my friend the policeman was hanging about near the scullery door. He shambled out and in a curiously furtive voice muttered something in my ear. "My identity card, did you say?" I tried helpfully. He nodded, his eyes fixed anxiously on a group of people passing close by; then calculating that they were safely out of earshot he laid a restraining hand on my arm. "It don't matter about the card," he said hurriedly, "it's

just—if you wouldn't mind—you see—er—I have to ask. Well the fact is I must know your age, Madam. Very unpleasant with ladies," he mumbled, pink with embarrassment, and avoiding my eye. Relieved to find that he was not going to reopen the subject of my lunch packet, I was only too pleased to tell him.

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The train journey, which was long, tedious and starred with many changes, offered a cross-section of England at war. In my various spells in different carriages, each of which was like a fresh world, the topics were new but the conversational treatment and the focus of interest were exactly the same as in peace-time—and no doubt differed little in essentials from those of the Stone Age. The woman with the squint and the droning voice, who recited deeds of valour performed by her son in the Navy, had exactly the same effect on her companion as if they were discussing a friend's charring appointment. This took the form of astonished repetition of the last words of her companion's sentences. "O' corse George says these noo guns they've got can fire miles and miles." "Miles and miles," echoed her friend. "Yus, and on his larst patrol before 'e come on leave 'e sez they saw two German supply ships wot 'ad scuttled therselves." "Scuttled therselves?" "Oh yus, 'e sez that's very usual, and if there's U-boats about they don't wait to pick up survivers, they just 'ops it." "Hops it!" "Yus, seems 'orrible dun it, and yet when I thinks of the mess them Jerries made of my 'ome—well it makes you mad." "That's right, it does make you mad." "Makes you wonder where its going to end dun it?" "That's it, where's it going to end?" They were still at it when I left them at Crewe.

The next two changes were uneventful—a couple of dowagers mewing for blood, a gloriously healthy looking W.R.N.S., a tired business man, and a few schoolboys. The third change was a goldmine; in the two far corner seats were a couple of young mothers, one with a baby in arms, the other with a small boy of about three. After eighteen months in the country they were taking their offspring back in time for the winter blitz. I regretted the possible loss of the baby, but after two hours I began to think that a bomb might improve young Ralphie. "Proper little tartar, 'e is," his mother confided to us as she ineffectually smacked the grubby little hands that fiddled with the blackout, the carriage doors, and the belongings of his immediate neighbours. "I can't do anything with him," she added with sombre pride. "Wot did you say, Ducky?" "I sez everyone's very spiteful," whined Ralphie, "policemen an neverybody. Not letting me look out. 'Cos it's pitch black out init, Mum? When I peeped out then I could see it was pitch black. It'll be pitch black when we get home won't it, Mum. Pitch black . . . pitch black . . ." His yammerings were drowned by the breathless life story of the little woman opposite. She looked about fifty, was in fact fifty, and had with her a granddaughter of about four years old—wreckling of a family of brothers the youngest of whom was thirty-one. By dint of her unceasing gabble she collected the attention of the whole company; and to the embarrassment of a cherubic young sergeant, treated us to an outline of her family's obstetric idiosyncrasies. The other two women and the hard-bitten sailor sitting next to me listened avidly. The background of the story was topical with bombs, evacuation and suchlike; but what held her hearers' attention was the "youman ellimink"—the worn obstetric track that never fails to grip the attention of the audience. Having given the subject a complete overhaul, she left it reluctantly for the small child sitting beside her. "Bin bombed out six times, she as, pore little mite," she remarked with naïve enjoyment; "larst time was a big one." "'Oo bombed yer 'ome, Duck?" she inquired suddenly. "That's right, 'itler. Sharp as a needle she is. What did 'itler do to our 'ouse, duck?" "Bombed it," the child squeaked cheerfully. "That's right, duck. She remembers all about it," she lowered her voice. "Mind you she's being tret for her nerves. Pore little blighter. Corse one can't expect not to be affected, can you? My ears, now, they always 'ave discharged but since the big bang I gets blood coming away. That's not right you know——" Encouraged by our absorbed attention she showed us her scarred hand; gave us a fascinating glimpse of her bad knee; hinted at other interesting lacerations, but lacking definite encouragement—except from the sailor—regretfully abandoned the idea of displaying them to us.

By this time the ice had been thoroughly broken, the sailor was exchanging snapshots with the pretty young woman with the baby, and confiding to her that he never ought to have got married on account of his itching feet. These I gathered were a spiritual rather than a physical complaint. In the meantime the sergeant had managed to prise the late obstetrical bloomer out of the conversation and told us that he was on his way to collect an absentee. His kindly soul was torn between dislike of his job and the knowledge that if his charge escaped he himself would automatically become a private. But he disliked the thought of using handcuffs. "What would you do?" he demanded, eyeing me wistfully. "Handcuff him," I answered promptly. He accepted this for the time being, but the last words I heard as I left the carriage and climbed out on to the busy platform were the flutings of the youngest mother. "Now don't be too 'ard on that pore man. I expect 'e's got a wife somewhere." "That's right," chipped in the elderly multip, "I know a woman whose husband deserted fower times in the last war. Never a bit of good to 'er 'e wasn't, and she idolised 'im—idolised 'im. Wouldn't 'ave 'im near the 'ouse—but idolised . . ."

* * *

Sitting on our new operating-table the other day was an outpatient, a broad-shouldered little man. He had dark curly hair, and his brown eyes mirrored at the moment that feeling common to most people when they are about to have a tooth out. Soon the brief operation was over; our anæsthetist put away the gas apparatus and a smiling patient was saying thank you in voluble Italian. Presently he went his way, back to the Prisoner of War Camp, a tall young British soldier with fixed bayonet escorting him politely. Our operating-table is a marvel. It is as full of tricks as a conjuror's bag: turn a wheel and press a lever and you have a dental chair—a reverse turn and you are ready for the Trendelenburg position. It accommodates all our specialists, whose procedures sometimes require their patients to adopt acrobatic attitudes in the surgical arena. It was not like this until recently. In the past we had to do our best with a fixed appliance—a table with no tricks. It was too tall for A, too short for B. Our E.N.T. Surgeon struck, and so for him we dug out a relic which did possess a limited range of movement. We made several abortive efforts to improve the situation; but official ears were closed to all importunities and there seemed nothing for it but to make the best of the ration tables and listen to the grumbles: Then one day the Luftwaffe butted in, and later we received a convoy of air-raid casualties, among them a citizen of the U.S.A. who had many friends. There was quite a conspiracy to steal him away from us almost before he arrived, but he decided that he wanted the rest and nursing that we were offering, and he stayed until he was well. His circle of friends had grown even larger before he departed, and we had certainly gained a benefactor. Thanks to him the American Red Cross was approached and a note arrived one day saying that an operating-table was to be supplied to the hospital. Some weeks passed and then one morning a packing-case arrived. Its size caused dismay, and when I unpacked it my fears were confirmed. Revealed stood a "fixed appliance" of all too familiar a type.

Sadly I went back to my office to look at the morning's mail, and as I read an official letter a gleam of hope returned: I was instructed to return operating-table as per schedule XYZ/100/200/890 to store! Old birds are not to be caught with chaff; I did nothing for a day or two till another letter arrived saying that an operating-table was on the way. Then I sent back the mistake and waited. We unpacked the huge crate which arrived at last and revealed to our wondering eyes a shining stainless-steel dream-come-true. As one enthusiast said, it would almost give the snuff and do the operation itself. Here are warm thanks to our friends across the Atlantic. We have had many tools from them to help us in our job, but the best bundle of all contained our table.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M.P.

THIS week a deputation of M.P.s is seeing Mr. Ernest Brown, the Minister of Health, on the Government proposal to set up a committee to inquire into the conditions of the A.T.S. and other women's services, and it is expected that some women M.P.s will be added to "the four young men," Sir Edward Grigg, Captain H. H. Balfour, Mr. R. Assheton and Sir Victor Warrender. But it is a curious commentary on parliamentary methods that no medical M.P.s, men or women, were proposed in the first instance. The questions to be considered—billets, camp accommodation, clothing and equipment—are all of the kind dealt with by the hygiene branch of the medical services. The complaints, in so far as they are justified, depend on the internal organisation of the services themselves and have been forcibly brought to the notice of ministers by many M.P.s as the result of complaints which they have received. The large expansion of the women's services which began last summer is the cause of the trouble.

* * *

In a written answer, to which of course supplementary questions may not be put, to a question by Sir Leonard Lyle on the staffing of E.M.S. hospitals, Miss Horsbrugh, parliamentary secretary to the Ministry of Health, said that "the allocation of the available man-power between military and civilian services is considered by the Medical Personnel (Priority) Committee presided over by the Parliamentary Under-Secretary for the Dominions and the number of doctors called up is based on the advice of that committee." This refers to the Shakespeare Committee which was appointed as a fact-finding body, and had as members representatives of the three services. Dr. G. C. Anderson, secretary of the Central Medical War Committee, also attended its deliberations. The Minister of Health lately issued an instruction that E.M.S. hospitals were to consider their "establishments," in the military sense of the word, but that they were to do it not for individual hospitals but for groups. There has recently been in progress a grouping of all E.M.S. hospitals in the country to provide the necessary link between them and the services, for purposes of administration affecting service personnel. It is presumably on the basis of this grouping that proposals fixing the numbers of doctors attached to E.M.S. hospitals will be brought forward. But it is doubtful if the best machinery to carry out these detail changes is a fact-finding committee appointed to make a general survey and lay down a general policy.

The Medical Parliamentary Committee considered this matter some time ago and discussed a project by which the three medical heads of the Navy, Army and Air Force would be constituted a committee with the addition of the director-general of the E.M.S., the chief medical officers of the Ministry of Health, a representative of the Central Medical War Committee and a representative of the general practitioners of the country appointed by the British Medical Association. Such a body would have all the information as to the needs of the Services and the E.M.S. at their disposal, while the representatives of the Ministry of Health and of the general practitioners would put forward the needs of the civilian population.

* * *

The hygienic conditions under which munition work and all war production is carried on is another aspect of the medical man-power situation to which little attention has been given. There is for instance only one medical inspector of mines, and the Secretary for Mines answering Dr. H. B. Morgan regretted that "it has not been possible under war conditions" to complete the examination of the report of the Safety in Coal Mines Royal Commission. This was also a "written reply." But doing nothing about urgent matters in war-time hinders production, and since all mines have some official and semi-official agreements with doctors to attend to the workers in illness and accident it should be possible to arrange something. Mr. F. Messer brought the same question forward when he asked Mr. Bevin "how many doctors have been appointed into industry under the Factories (Medical Welfare) Order 1940?" The reply was that whole-time doctors have increased by about 100 and part-time doctors by about 400. These appointments added to the few which existed before cover only a small part of the field. The bulk of productive industry in this country is carried on in small establishments; many do not employ more than 25 people and there are few really big organisations. What is needed in war-time is not any elaborate inspection but the general hygienic supervision of conditions, analogous to the work of the hygiene branch of the R.A.M.C., which could be done by general practitioners coöperating with the local medical officers of health.

* * *

The debates in the House last week were not exciting but parliamentarily useful. In the debate on Offices of Profit under the Crown the question of what does and what does not disqualify any person from sitting as an M.P. was considered. Dr. Haden Guest stressed the desirability of defining the "office of profit" so as not to debar members of the scientific professions, including medicine, from becoming M.P.s. With the growing recognition of the importance of the social relations of science, these people were among those best qualified to serve the state in Parliament, but if the tendency towards Government service extended, as was very probable, most of the scientific professions would be excluded. Prof. A. V. Hill in a question drew attention to the same point when he urged the Government to arrange for close collaboration with the scientists of India.

* * *

One of the institutions of the House is the Ballot for Notices of Motions to be moved when supply is debated. Mr. H. McNeil had the luck to draw second place for a motion on hospital administration and it is his intention to cover the field of Scotland and England and Wales.

FROM THE PRESS GALLERY

Government Grants for Science

THE Financial Secretary to the Treasury, on Feb. 4, in introducing a supplementary estimate for £69,000 for grants in aid of scientific investigation, said that the Government had decided to give a new and independent status to the Agricultural Research Council and bring it up to the status of the Department of Scientific and Industrial Research and the Medical Research Council. He did not know whether any of the money provided in this supplementary estimate was going directly to the agricultural colleges, but the grants were largely for work done by agents of the colleges, for instance the Schools of Agriculture and Animal Pathology at Cambridge, the Institute of Animal Parasitology, and grants to Rothamsted, Reading University and many other institutions. On another supplementary vote of £255,535, including grants for agricultural research, eradication of animal diseases and the improvement of breeding, Mr. R. S. Hudson, Minister of Agriculture, explained that an item of £133,000 was mainly accounted for by the outbreak of foot-and-mouth disease.

War-time Nurseries

Mr. KENNETH LINDSAY, who raised the question of war-time nurseries after the adjournment on Feb. 5, said he felt we should all work, however difficult it may be now, towards a single joint authority for all children under five and over five. He thought the major responsibility should lie with those who are responsible for the whole growth of children, and not for one particular aspect of children—their health. Mr. ERNEST BROWN, who replied, said there was no difference between the President of the Board of Education and himself, or the Minister of Labour and himself, on this matter. Each of them had his own function, and they all meant to do two things—first to increase effective child care, and secondly to have regard to the immense problems resulting from the increasing demand for married women to take their part in the industrial war effort. Considerable progress had been made, not merely with war-time nurseries but also with nursery classes. The questions remaining to be solved were nearly all problems of labour and materials.

There were 360 residential nurseries in the reception areas, all having in them children under five, and at the end of January there were 276 war-time nurseries in operation, 374 more approved and 257 more projected, making a total of 907 compared with 457 at the end of September. He thought they would have a further 100 in operation during February, and probably 150 in March.

QUESTION TIME

Medical Inspector of Mines

Dr. H. B. MORGAN asked the Secretary for Mines why there was only one medical inspector of mines, who also acted as medical adviser to the Mines Department: and, whether, having regard to the number of mines in this country, the number of miners employed, the heavy incidence of accidents and industrial disease and the need for medical supervision and advice, his department would consider the immediate advisability of appointing at least four more medical inspectors.—Mr. DAVID GRENFELL replied: The Royal Commission on Safety in Coal Mines made certain recommendations in regard to medical and allied services, which would involve some increase in the medical inspectorate. Those and many other recommendations of the commission, which were accepted in principle by the Government, were under consideration as a whole when the war broke out. I regret that it has not been possible under war conditions to complete our examination of the wide field covered by the Royal Commission's report.

Doctors for Industry

Mr. MESSER asked the Minister of Labour how many doctors had been appointed into industry under the Factories (Medical and Welfare) Order, 1940; what method of appointment was there to ensure the appointment of the most suitable candidates; and whether there was any coördination of this type of industrial medical work.—Mr. ERNEST BEVIN replied: Since the making of the Factories (Medical and Welfare) Order 1940 the numbers of whole-time and part-time works doctors have increased by about 100 and 400 respectively, and it has not so far been necessary to exercise the powers given by the order to give directions for such appointments to be made. It is for the employer to select the doctor but the arrangements have to satisfy the inspector of factories, and while in a very few cases the appointment has proved unsatisfactory and the doctor has been relieved of his post, I am advised that generally speaking the doctors appointed are carrying out the work well and that no complaint from workmen's organisations regarding any of the appointments has reached the senior medical inspector of factories. There is substantial coördination of the work with outside health services, and the importance of this is stressed in departmental advice and otherwise.

Medical Referees

In 1940 the number of appeals under section 43 (1) (f) of the Workmen's Compensation Act was 3119, of which 2430 were in respect of dermatitis. The number of cases in which the examining surgeon's decision was confirmed was 1737 and 1319 respectively. (Mr. HERBERT MORRISON replying to Dr. MORGAN.)

Dr. MORGAN: Is the Home Secretary satisfied with the present arrangements with regard to medical-referee decision in cases of industrial disease claims for workmen's compensation; is he aware of the injustice of the present one-man final decision, often by a medical referee inexpert in the particular disease; and what steps is he proposing to take now to remedy the present system which is unjust to workmen claimants?—Mr. O. PEAKE replied: The Minister is well aware of the objections taken to the procedure prescribed by the present acts for determining medical issues in these cases, and recognises that this is one of the questions to be reviewed in connexion with any revision of the Workmen's Compensation system. There are already a considerable number of specialist medical referees appointed to deal with the chief industrial diseases and, so far as present circumstances permit, steps have been taken, as recommended by the Stewart committee, to appoint additional referees for cases of dermatitis. I would add that there are arrangements for enabling any medical referee who experiences difficulty in any case to obtain special assistance.

Medical Man-power

Sir LEONARD LYLE asked the Minister of Health how it was proposed in case of need to staff the emergency hospitals with medical men; and whether, in view of possible enemy action and the outbreak of an epidemic, he would, in the interests of the civilian population, refrain from permanently calling up any more doctors.—Miss F. HORSBRUGH replied: Emergency hospitals are provided with medical staff to meet such needs as can be immediately foreseen. Any exceptional pressure on a hospital would be met by transfers from other hospitals under plans worked out in advance, by calling on available practitioners whose names have been placed on a rota for that purpose or by coöperation with Service medical establishments, or by a combination of such methods. The allocation of the available medical man-power between military and civilian services is considered by the Medical Personnel (Priority) Committee presided over by Mr. Shakespeare, and the number of doctors called up is based on the advice of that committee.

Sir L. LYLE: Has the Minister's attention been called to the number of idle doctors in uniform and the shortage of medical men in civil life; and would he see that the fighting forces provided, where possible, some measure of interworking between their respective medical men so as to simplify and accelerate medical attention and liberate numbers of such medical men, after a brief period of attachment to their units, to enable them to familiarise themselves with their prospective duties, on the understanding that should any sudden emergency arise they would at once be recalled to their posts?—Mr. E. BROWN: All practicable steps to secure the economical use of doctors in H.M. Forces and in civilian services are being examined by the Shakespeare committee. Further coöperation between the medical branches of the three Services has already been secured in accordance with the recommendations of this committee and of the Robinson committee, thus reducing, without any loss of efficiency in the Services, the number of doctors that would otherwise have been required. A system of releasing doctors from the Services to civilian practice, where there are special reasons for this course, is already in operation.

Sir L. LYLE: Is there not a great danger to the civil population, and therefore to the war effort, if the present methods are persisted in, and will the Minister make a representation to the War Office?—Mr. BROWN: This work is under the chairmanship of Mr. Shakespeare and a most powerful committee.—Dr. EDITH SUMMERSKILL: In spite of the Minister's reassurance, is he aware that a number of doctors are doing clerical work who might be released for clinical work?—Mr. MESSER later asked if the Minister was aware that some factories are depleted entirely of their medical staffs. One factory employing 6000 people had no medical officer.

Medical Evidence in Pensions Cases

Mr. RHYS DAVIES asked the Minister of Pensions whether he would reconsider his attitude towards claims for pensions in cases where medical evidence did not support the view that the ailment from which the claimant was suffering was either attributable to or aggravated by war service, especially in view of the fact that it was not possible for any medical man, in the nature of neurosis cases, to provide his department with either positive or negative proof of attributability or aggravation.—Sir W. WOMERSLEY replied: The war pensions provisions for members of the Forces do not permit of an award of pension for disablement which is neither attributable to nor aggravated by war service. Successive Governments have maintained this principle as the only sound basis for such pensions, and I can hold out no hope of a departure from it. The question of connexion with service in an individual case is one on which my medical officers are well qualified by their long experience to give me advice, and they give full consideration to all relevant factors, including the nature of the disabling condition as well as the service and medical history of the claimant. In neurosis cases I am acting on the advice of a conference of medical experts presided over by Lord Horder.

Mr. G. BUCHANAN: Is the Minister aware that in the last war persons knew the case against them and were supplied with all the facts. Laymen had a point of view as well as medical men on these matters and would not the Minister give a fair hearing to the claimant before a decision was reached?

Sir W. WOMERSLEY: In every case the claimant's representatives are allowed to put their evidence before the medical experts and get a fair hearing. The claimant's local panel doctor may put a case forward and it will be considered. He assured the House these medical experts did their job well.—Mr. DAVIES expressed himself dissatisfied with the Minister's reply and gave notice that he would raise the matter again.

Sir W. WOMERSLEY informed Sir SMEDLEY CROOKE that since the beginning of the war 96 pension claims had arisen which were considered to require reference to an independent medical expert on the ground of serious doubt or difficulty on the medical evidence. In 38 of these cases the claim arose in respect of death. Of the 58 claimants in respect of disablement the independent expert, who had unfettered discretion in the matter, decided to examine 8. Personal examination was not, as a rule, considered necessary when there was no difference of opinion as to diagnosis.

Our Daily Bread

Replying to a question by Sir E. GRAHAM-LITTLE Major LLOYD GEORGE said calcium was not at present being added to any white flour, but the Minister of Food hoped to make an early statement on the matter.

Synthetic Vitamin B_1

In answer to a further question he added that the amount of synthetic vitamin B_1 being added to white flour raises its B_1 content to about that of national wheatmeal. The addition of the vitamin is carefully controlled and constantly checked so that any variations in the level of intake of vitamin B_1 due to different levels of bread consumption, applies equally to both types of bread. There is no possibility whatever of any harmful effects from the vitamin B_1 at any level of bread consumption in either fortified white bread or national wheatmeal bread.

Gingivitis

There has been a considerable amount of infective gingivitis among the services and some cases among the civilian population. The evidence that this condition is due to dietary deficiencies is far from convincing and there is some reason to think that it is purely infective. (The Minister of Health replying to Sir. E. GRAHAM-LITTLE.)

Exchange of Statistics

Sir FRANCIS FREMANTLE asked the Secretary of State for Foreign Affairs if he would arrange a systematic exchange of information as to the prevalence of typhus and other infectious diseases, both civil and military, with the Soviet government. —Mr. A. EDEN replied: I will endeavour to arrange such an exchange of information.

Infectious Disease in England and Wales

WEEK ENDED JAN. 31

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1076; whooping-cough, 1439; diphtheria, 892; paratyphoid, 14; typhoid, 10; measles (excluding rubella), 1235; pneumonia (primary or influenzal), 1304; puerperal pyrexia, 167; cerebrospinal fever, 156; poliomyelitis, 5; encephalitis lethargica, 6; dysentery, 125; ophthalmia neonatorum, 69. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fevers, 3 (0) from scarlet fever, 2 (0) from measles, 14 (4) from whooping-cough, 33 (4) from diphtheria, 48 (9) from diarrhœa and enteritis under 2 years, and 90 (15) from influenza. The figures in parentheses are those for London itself.

Fatal cases of influenza were scattered over forty-eight great towns, Birmingham reporting 4, no other town more than 3. There were 5 deaths from diphtheria at Liverpool.

The number of stillbirths notified during the week was 230 (corresponding to a rate of 38 per thousand total births), including 20 in London.

Sir HAROLD GILLIES writes to say that the film on plastic surgery in war-time (*Lancet*, Feb. 7, p. 188) which was made for exhibition in the United States and Latin America was intended to show injuries and not results. Sir Harold himself operated on only two of the cases and the other operations were done by members of the unit.

Corrigenda.—Mr. Harvey Jackson was reported (*Lancet*, Jan. 31, p. 141) as having said, at the RSM discussion on sciatic pain, that hernia of the nucleus pulposus by itself did not produce sciatica. Actually he wished to infer that sciatica per se is not adequate evidence on which to diagnose hernia of the nucleus, but that sciatica associated with pain and postural changes in the lumbar region might be so caused.—Dr. D. S. FLEMING (*Lancet*, Jan. 31, p. 129) is a graduate of the University of Minnesota and not of McGill University.

Letters to the Editor

PANCREATIC FISTULA IMPLANTED INTO THE STOMACH

SIR,—I should like to congratulate Mr. Harold Edwards on the fine judgment and skill he demonstrated in the management of his case of pancreatic fistula, as reported in your issue of Jan. 31 (p. 137). His paper will undoubtedly stimulate fresh interest as regards the most successful treatment to adopt in cases of pseudo-pancreatic cyst and also of those difficult cases of intractable pancreatic fistula which follow drainage of a false cyst. The generally accepted treatment for false pancreatic cyst is marsupialisation and drainage, as originally recommended by Gussenbauer. This is well exemplified in E. S. Judd's series (*Arch. Surg.* 1931, **22**, 838) of 47 cases, of which 44 were treated by marsupialisation and drainage and only 3 by complete excision of the cyst. It should nevertheless be remembered that in the 9 recorded cases of primary anastomosis between a pancreatic cyst and a portion of the intestine there was no postoperative fatality and the late results were excellent in every respect.

It is generally agreed that complete excision of the cyst is dangerous and is often followed by leakage of pancreatic juice and fistula formation. The mortality following extirpation of a pancreatic cyst is about 20% provided the cyst is completely removed, but it may be as high as 55% if excision is attempted and fails. In Mr. Edwards's case drainage was undoubtedly the correct primary procedure, for his patient was in extremis and the diagnosis uncertain; but for the more chronic types, in which the cyst wall may be considerably thickened, a short-circuiting operation—pancreatico-enterostomy—may well be the method of choice, as emphasised by F. H. Lahey (*Surg. Gynec. Obstet.* 1937, **64**, 79).

In most cases of pseudo-pancreatic cyst which are treated by marsupialisation sound healing of the tract may be expected within six weeks, provided a well-planned course of treatment is instituted which includes protection of the skin with kaolin or aluminium paste, measures for lessening pancreatic secretion by Wohlgemuth's regime (*Berl. klin. Wschr.* 1908, **44**, 47), and the preservation of the pancreatic juice which has been obtained by continuous water suction and its reintroduction into the alimentary tract after it has been thoroughly mixed with food. In those cases where the pancreatic fistula persists for more than six weeks it will often be necessary to dissect out the tract and anastomose it with the stomach or jejunum. Up to date 27 cases have been recorded in which the coned-out fistula has been anastomosed to some portion of the intestinal tract. Of these, 15 were performed as pancreatico-gastrostomy, 10 as pancreatico-jejunostomy, 1 as pancreatico-cholecystostomy, and 1 as pancreatico-cholecystostomy followed by cholecystogastrostomy. In this series there was only one death—namely, Holbaum's case (*Zbl. Chir.* 1927, **54**, 1436). In all the other cases the immediate and late results were in every respect gratifying.

Although Mr. Edwards's case of implantation of the fistulous tract into the stomach was highly successful, I maintain that it is safer and easier to implant the tract into an adjacent coil of jejunum, and I would suggest the following technique.

The fistulous tract is plugged with gauze and coned out of the abdominal wall. The abdominal incision is enlarged above and below the coned-out area to allow of free access to the stomach, the pancreas and the structures in the immediate neighbourhood. The distal end of the fistulous tract is seized with Allis forceps to keep it taut while it is pared down to its indurated base in the pancreatic substance. In the process of paring the tract, pains must be taken not to buttonhole it or to make it too thin as this would render it useless for implantation into the intestine. A rubber tube which fits the tract snugly is next introduced right to the bottom of the tract down to the pancreas and then tied in position near the distal end of the fistula with a stout silk ligature.

The tract is prepared in this manner before an opening is made in the jejunum for its reception. A loop of proximal

jejunum is next brought over the transverse colon and laid by the side of the fistulous tract in such a way that there is no kinking or traction of the intestine. The selected portion of jejunum is lifted up with four pairs of Allis forceps, and at a chosen point exactly opposite the antimesenteric border a purse-string suture of fine silk is inserted, and in the centre of this a small hole is made with mosquito forceps. As the Allis forceps exert upward traction and steady the gut, the forceps are thrust through the wall of the intestine and the blades are separated to make the opening of sufficient size to accommodate the fistulous tract. Two silk sutures, threaded on intestinal needles, are passed near the end of the fistulous tract. These help to guide or lead the tract into the jejunum, and when it is ascertained that the tract and the rubber tube are lying comfortably in the lumen of the intestine, the purse-string suture is drawn taut and tied, while the guide sutures are immediately removed. The tightening of the purse-string suture cannot occlude the lumen of the fistulous tract owing to the presence of the retained rubber tube.

The jejunum is then anchored to the base of the fistulous tract above and below and to the tissues around on either side, not only to fix it into position and to prevent it from being drawn away from the fistulous tract but also to avoid any angulation of the intestine where it is sutured. Portions of the adjacent omentum are drawn over the operative site and the abdomen is closed in the usual manner, pains being taken to guard against dehiscence of the wound. After a variable time the rubber tube in the fistulous tract works loose and is passed per anum.

I maintain that the technique here described is preferable to that outlined by Mr. Edwards, in which a portion of the skin of the abdominal wall is anastomosed to the mucous membrane of the stomach The skin must become digested and in this process leakage may possibly occur at the line of anastomosis. Again, there are many disadvantages in the partial loss of pancreatic ferments which result from the interaction of gastric secretion and the pancreatic juices.

Wimpole Street, W.1. RODNEY MAINGOT.

INTRAOCULAR FOREIGN BODIES

SIR,—The extraction of magnetic foreign bodies from the vitreous chamber of the eye by the scleral route—a procedure condemned by your reviewer of Spaeth's book—is a satisfactory operation and one likely to cause less damage to the eye than if such fragments are pulled out through the suspensory ligament of the lens and through the anterior chamber. This was the conclusion of William Sweet of Philadelphia, who reported on over 700 cases of intraorbital foreign body, many of them treated by himself, and most of them patients of the Wells Hospital, Philadelphia, where he X rayed the eyes. He undertook a careful follow-up of the patients and so his opinion is founded on a wide knowledge of the subject. His conclusion is certainly borne out by the results in those patients on whom I have used the method.

I realise that there is antagonism in some quarters to the scleral operation, and I have in the past tried to find out on what grounds it is disliked. I found that the objections—three in number—were for the most part theoretical and often voiced by those who had not tried the method. First, they said, it increases the liability to retinal detachment; but this statement has no foundation in fact, and was disproved by Sweet's careful follow-up. Detached retina does not follow sclerotomy for glaucoma, so why should one expect it after sclerotomy for foreign-body extraction? If the surgeon persists in regarding it—against all the facts—as a drawback, he can apply the diathermy to the sclera before making the section; but I have never done this myself as I consider it unnecessary and it adds further injury to a severely damaged eye. Secondly, they said, there is the likelihood of vitreous loss during the operation. I can only reply that if the operative procedure is correct vitreous does not escape and does not appear likely to do so. The third objection was that a weak scar would be left in the sclera. There may be more point to this objection, but if the incision is placed beneath the reflected external rectus, and if the scleral wounds are closed by sutures which have been inserted before the section is made, then I do not think there is any danger of a weak scar.

The scleral approach is especially suitable to the vitreous foreign body of war-time, which often contains a very small amount of iron and is therefore only slightly magnetic. By this method the magnet can be brought nearer to the fragment and there is thus more likelihood of it being extracted.

The end-result in these patients is determined by factors largely outside the surgeon's control—the extent of the damage already done to the eye, and the length of time the foreign body has been present. The surgeon's aim must be to extract the particle with as little additional damage as possible, and I believe that this condition is fulfilled by the scleral operation.

Harley Street, W.1. SEYMOUR PHILPS.

GINGIVITIS IN THE FORCES

SIR,—In their letter of Jan. 31 (p. 153) Dr. Stuhl and Mr. Coventry state that the gingivitis occurring in the Midlands is due largely to lack of vitamin C. They suggest that "the initially swollen and bleeding gum" (presumably a manifestation of active scurvy) became infected "where treatment was delayed," and give the impression that the septic gingivitis was due to organisms already present in the patient's mouth. During the past three months, in a hospital not far from their own, I, too, have seen a number of patients with gingivitis, 57 of them soldiers. From the description of the disease given by Dr. Stuhl and Mr. Coventry it appears that the cases I have watched are of the same nature, but my conclusions are different.

I do not doubt the prevalence of vitamin-C deficiency, for, though I have been unable to carry out blood or urine estimations on my patients, the observation has been confirmed by other workers in the district and the patients' descriptions of their diets were certainly suggestive. I agree entirely that such dietetic inadequacy should be remedied but I doubt whether it is the factor primarily responsible for the present outbreak. If it is, the condition should be rapidly cured by ascorbic acid, even without local treatment, but this has not been my experience. Possibly I gave inadequate amounts of the vitamin, but surely if deficiency is responsible a few patients should show hæmorrhage into the hair follicles, or some other manifestation of scurvy. Neither they nor I have yet met such cases. For the following reasons I believe that infection is the essential cause of the epidemic:

1. The disease has not been sporadic, as might be expected with scurvy, but contact with other cases has been the rule.
2. There have been two examples of a man on leave infecting his wife and at least one instance of spread in a ward, the patient affected having been in hospital and on an excellent diet for many weeks.
3. A few of the patients, especially those working as cooks, have had plenty of fruit.

In curious contrast to the experience of Dr. Stuhl and Mr. Coventry, Vincent's organisms, which I had assumed to be responsible for the fœtor, have been present in profusion in almost every case. It would be unwise to say that they cause the disease, for the weight of evidence suggests that they are only secondarily pathogenic. I have previously stated my belief that the primary cause of the condition is a virus (or thrush in infants) which prepares the ground for invasion by Vincent's organisms (*Arch. Dis. Childh.* 1940, **15**, 43). It is possible that vitamin-C deficiency may similarly lower resistance to the infecting virus. Roughly a quarter of the patients I have seen developed labial herpes in the course of the disease, and at the onset some had an herpetiform eruption on the oral mucous membrane. I do not consider that this in itself is evidence that the herpes virus is responsible for the condition, for all the men who developed labial eruptions were subject to recurrent herpes, usually associated with upper respiratory infections, and in no case did herpes develop de novo during the course of the gingivitis. There is, however, experimental evidence to support the view that it is the herpetic virus which is the essential cause of this kind of gingivitis (Dodd, K., Johnston, L. M. and Buddingh, G. J., *J. Pediat.* 1938, **12**, 95; *Amer. J. Dis. Child.* 1939, **58**, 907).

I hope that Dr. Stuhl and Mr. Coventry will be able to report the comparative results of treatment: (*a*) with ascorbic acid alone; (*b*) with local treatment only; and (*c*) with a combination of both. My own feeling is that the excellent results they have obtained are due to the very efficient local treatment which they prescribe,

rather than to the giving of vitamin C, however necessary this may be. "The preparation must be applied to the interdental spaces by soaking pledgets of cotton-wool in the solution and probing them into these spaces where possible." This suggests personal daily supervision by a dental officer and I am sure that therein lies the secret of their success. The solution applied is probably of little importance although I still pin my faith to the easily seen gentian violet.

Lichfield, Staffs. CLIFFORD G. PARSONS.

SUPERFLUOUS PREPOSITIONS

SIR,—I have been distressed lately by meeting in THE LANCET, not only in the original articles but even in the editorial comments, the expression "try out." Have the words "try" and "test" gone out of conversational currency? In crime stories I expect the chief of police on receiving some new information to send one of his subordinates to "check-up on it." It would be beneath him to tell his subordinate merely to "check" the information. We used to refuse to "stand" or "tolerate" an injustice; now we refuse to "stand for" it (this intrusive and unnecessary "for" finds no authority in the Oxford English Dictionary, or justification in Wright's Dialect Dictionary). If my present grievance cannot be met I suppose I must face up to it.

Wakefield. REGINALD LAWRENCE.

*** Under "try out" the Concise Oxford Dictionary gives "put to the test, test thoroughly."—ED. L.

POSTURE DURING SLEEP

SIR,—It may be of interest to mention some facts brought out by the experiments in bronchospirometry conducted by Bjorkman. He tested several persons, in different postures, and found that—in direct opposition to views previously held—the uppermost lung did a lesser share of the work than the lower, compressed lung. Results obtained during these investigations may be read in an article by H. C. Jacobæus (*Brit. J. Tuber.* 1936, **30**, 114).

Kelling Sanatorium, Norfolk. B. G. RIGDEN.

INFECTION OF FOODSTUFFS

SIR,—There is one matter in connexion with the outbreak of paratyphoid fever so fully and ably reported upon in your issue of Jan. 31 on which further information would I think be appreciated by those concerned with public-health administration. For many years efforts have been made, with more or less success, to secure that in all premises where food is prepared hand-washing facilities shall be provided as near as possible to w.c. accommodation, and that the importance of hand washing immediately after the use of the w.c. shall be impressed on all workers by suitably placed notices. May we ask what were the arrangements regarding these matters at the firm in question, and what was the practice of the carrier who was responsible for the outbreak?

Potters Bar. MAITLAND RADFORD.

RELAPSING FEVER

SIR,—The discovery recently in a London hospital, by Dr. Stannus, of a refugee from the continent suffering from relapsing fever (*Lancet*, Jan. 24, p. 103) is a fresh instance of the possibilities of transmission of disease by aircraft. Good fortune took the man to someone with African experience. As to *Ornithodoros tholosani* being a vector of the spirochæte in Persia, it may well be so; but Dr. C. M. Wenyon tells me that the latest reference (Donuschevsky, Latuishev *Rev. appl. Ent.* 1927, **15**, 216) is not conclusive. It is certain, however, that the body louse is a vector in epidemics there, generally with typhus fever and in times of famine. This was so when British troops were last in Persia—that is to say, during and after the war of 1914–18.

Perhaps another famous vector problem may be settled now. Will some enterprising medical officer succeed where others have failed and learn if "Mianeh fever" really exists and if so whether it is a relapsing tick-borne disease conveyed by *Argas persicus*, the "gharib gez" (the stranger-biter)?

Droitwich. A. R. NELIGAN.

RED CROSS HOSPITAL IN CHINA

SIR,—After consultation with representatives of the British Government, the war organisation of the British Red Cross Society and Order of St. John decided to offer to send out to China the personnel and full equipment for a hospital of 200 beds to work in close coöperation with the Chinese Red Cross, and to be located in some place accessible to the motor road system of Free China. The Chinese Ambassador was approached and cabled his government in Chungking which replied gratefully accepting the offer.

Dr. H. Gordon Thompson, secretary of the British Fund for the relief of distress in China, is acting as secretary in this section of our work. The scheme envisages a British staff of an administrator, four surgeons, three physicians, a radiographer, a storekeeper and accountant, a matron, and 14 nurses. Doctors and nurses, especially any who have knowledge of the Chinese language, are required and should communicate as soon as possible with Dr. Gordon Thompson, 14, Grosvenor Crescent, London S.W.1. Their letters should be marked "China."

HORDER,
Joint Chairman, Hospitals and Medical Services Committee.

"STATUS OF WAAF DOCTORS"

SIR,—On Jan. 31 (p. 156) you published a paragraph under this heading completely at variance with the truth which is that:—

1. Women medical officers working with the RAF medical service are not and never have been in the WAAF.

2. Women medical officers have always attended men as well as women in the Air Force.

3. Women medical officers have not been granted equa status with their male colleagues in the RAF.

4. A woman medical officer if appointed as SMO of a station could not carry out her duties efficiently with her present status.

As a woman medical officer I am greatly concerned at the recent Air Ministry order which has confirmed we are virtually without rank. We are not allowed to be addressed by our rank title and we hold our "relative rank" solely with regard to other women medical and dental officers.

While writing this protest I would like to add that the generous loyalty of our male colleagues has enabled us to carry out our duties without the lack of status becoming apparent.

WOMAN MEDICAL OFFICER.

Obituary

CHARLES ARTHUR MOYNIHAN

M.R.C.S.; CAPTAIN R.A.M.C.

Captain Charles Moynihan, who was killed in Malaya in December, at the age of 28, was born in Santa Cruz, the second son of Mrs. D. M. Moynihan and the late Mr. H. J. Moynihan of Gloucester Place, London. He was educated at University College School, King's College and the Westminster Hospital where he took his M.R.C.S. in 1937. He had already made up his mind to join the R.A.M.C., but first he was eager to do some post-graduate work in his chosen specialty and within a few days of qualifying he had obtained a house-appointment at St. Paul's Hospital, Endell Street, where he had opportunity to study the pathology and blood reactions of disease. He was a sensitive man and a fellow resident recalls sympathetically his anguish at the horrors of the Spanish civil war in which many of his personal friends were involved. Moynihan entered the R.A.M.C. in 1937, was promoted captain a year later, and when he died was acting major.

EADRIC CLIFFORD FOUNTAINE

M.R.C.S., D.T.M. & H. ; CAPTAIN R.A.M.C.

Captain E. C. Fountaine, who was killed on Jan. 3, in Iceland, as the result of an accident, was a mountaineer and traveller as well as a doctor. From Jesus College, Cambridge, he went up to Bart's, spending his holidays climbing in Wales, Skye, and Switzerland, and he was a pre-war visitor to the Lofoten Islands. He qualified in 1933 and held house-appointments at Bart's and at Chichester Hospital before sailing in 1935 to Greenland in the *Quest* on a geological and surveying expedition. He was one of the party who made the first ascent of the highest peak in the Arctic—one of the Watkins range—and later wintered at Kangerdlugssuak, on the east coast of Greenland, where he also took part in sledging journeys and climbs. After his return to England in 1936 he was awarded the Duncan medal for his work in the D.T.M. & H. course at the London School of Hygiene. He spent some time as an assistant in Norfolk before he sailed in March, 1939, for India with a party, led by Mr. Eric Shipton, who intended to spend a year or so in unexplored parts of the Karakoram range. The expedition had crossed and mapped several new passes when on Oct. 1 news of the outbreak of war reached them, and they had reluctantly to abandon their plans. There was some delay before Fountaine got a passage home and he only returned to set out once more, this time with the British Expeditionary Force to Norway. On his return he served in various parts of this country before he was posted to Iceland in October.

A friend has aptly written of him: "Besides being a very good doctor Fountaine realised that he had only one life on this earth to live and that life has many aspects." And of these he took full advantage in his thirty-five years. He was the eldest son of the late Mr. A. C. Fountaine of Croydon.

A SYMPOSIUM ON CHEST WOUNDS

THE E.M.S. chest unit for Liverpool and the north-western area is developing a chest centre through which it will be possible to admit patients to the Clatterbridge Municipal Hospital. At present the unit and the centre are commingled, but it is hoped that when the war is over and the unit disappears—with the emergency to which it owed life—the chest centre will be fully established and able to carry on the responsibilities of peace. At a meeting on Jan. 29, Mr. H. MORRISTON DAVIES, director of the chest centre, Merseyside Group, resumed the reading and discussion (begun on Jan. 15, see *Lancet*, Jan. 31, p. 148) of a series of short papers on war wounds of the chest at the Liverpool Medical Institution.

The final meeting of the course will be on Feb. 12.

SHOCK AND SUCKING WOUNDS

Mr. J. T. MORRISON, speaking of shock and sucking wounds, said that plasma was not contra-indicated in the treatment of shock in cases of wounds of the lung. Shock in such cases might be due to bone damage, anoxæmia resulting from open thorax, pressure pneumothorax or hæmothorax, cardiovascular embarrassment from mediastinal displacement, trauma of mediastinal nerve plexuses, or of course hæmorrhage. Persistent hæmorrhage called for immediate operation while blood-transfusion was actually being given. He classed wounds of the chest into those with an entrance wound only, those with entrance and exit wounds, and those with tangential wounds. With those in the first group operation was not usually required if the foreign body was small; if it was large and accessible it should be removed. The parietal wound should be excised, to prevent sepsis, as soon as the general condition allowed; damaged bone should be removed freely. When the pleura was intact the wound should be dealt with like a wound in any other part of the body; small tears in the pleura might be ignored, but with larger openings part of a rib should be removed, and the cavity explored and mopped dry; any foreign bodies should be removed and closure should be airtight. Closed intercostal drainage in the postscapular line would meet the danger of sepsis. He considered that sucking wounds were among the few indications for surgery at first-aid posts; they must be closed at the earliest possible moment by suture, strapping, or layers of 'Vaseline' gauze. When the patient reached hospital, oxygenation must be maintained during operation. After excision of the wound the chest must be closed by approximating the ribs, by muscle flaps, or as a last resort by skin only. Separate intercostal drainage was needed until the danger of empyema was past. The patient was nursed in the Fowler position and the pillows must be arranged vertically so as to give easy access to dressings. Wounds seen after 6–12 hours would usually only be suitable for debridement, with opening up of subfascial tracks, removal of accessible foreign bodies and relief of tension. In carrying out these measures it was important to avoid opening up any pleural wound which might have become sealed off; if such a wound was accidentally opened the pleura should be closed again and drainage provided at a suitably dependent point.

FOREIGN BODIES IN THE LUNG

Mr. HUGH REID said that treatment of cases with foreign bodies in the chest called for the coöperation of the physician, surgeon and radiologist. Such coöperation was achieved by the weekly conferences at the chest centre. In diagnosis, history and clinical signs were doubtless important, but among air-raid casualties the history obtainable was often defective and the clinical signs difficult to interpret, giving no idea of the number, size or position of the foreign bodies retained in the chest. Radiology, then, was of paramount service, but the films must be good, correctly centred, penetrating to show up the foreign bodies, and including the whole chest. They must be taken at the earliest possible moment so that treatment was not delayed, and a lateral as well as anteroposterior film was needed. Blair and Sellors of the Harefield Thoracic Unit held, he said, that patients on admission should be sent to the wards by way of the X-ray department; they need not be moved from the stretcher. Among pitfalls in localising a foreign body were the facts that marks made on the skin shifted their relative position when the shoulder girdle was moved, and that foreign bodies were shifted in the lung by movements of the patient. In early cases shock, hæmorrhage, infection and disordered respiration and circulation must be treated, and shock was of course the first consideration. A counsel of perfection in early cases was to remove the foreign body at once, because treatment for hæmorrhage, lung laceration and contamination could be carried out at the same time, and the wound could be excised. In cases seen later the foreign body should be left in situ until the wound healed; in the meantime such conditions as hæmothorax could be treated. Foreign bodies less than ¼ in. square need not be removed; larger foreign bodies should probably always be extracted because they were liable to give rise to pulmonitis, fibrosis, bronchiectasis, repeated hæmoptysis, and, if near the surface, to pleural adhesions, if deeper to pericardial irritation. It might, however, take as long as 30 years for symptoms to manifest themselves; the choice, therefore, was between a difficult and often dangerous operation, and the chance of chronic illhealth from complications. The operation of choice was thoracotomy as practised by Duval; the incision into the lung was not attended with undue bleeding. It might be feasible to pass alligator forceps into the lung through a small stab wound and extract the foreign body under direct vision by X-ray screening, but he had not attempted this.

ANÆSTHETICS

Dr. JOHN HALTON said that two main groups of chest-wound cases needed inhalation anæsthesia: immediate cases, requiring operation within 6–8 hours; and deferred cases requiring operation at some chosen time later. In the first group some degree of anoxia was always present as a symptom of shock. Those in the second group though not actually anoxic were often near it, and an ill-chosen anæsthetic might precipitate a crisis. Shock, by altering the oxygen dissociation curve and diminishing the alkali reserve of the blood, also complicated anæsthesia. The method chosen must give the surgeon scope and must not produce anoxia or increase it if present; it should rather counteract anoxia. Rapid induction and recovery were needed, together with easy control of the depth of anæsthesia and minimal postoperative toxic effects. Nitrous oxide might appear to meet these

requirements but was extremely dangerous in major thoracic injuries and should never be used without carbon-dioxide absorption. Even with absorption and in expert hands it might cause a grave degree of anoxia which was almost free of signs at first ; a rising pulse-rate and gasping respiration were late—and almost the only—signs. The anæsthetics of choice were : light ether-oxygen given in a closed circuit, with the Oxford apparatus or an Ogston mask ; cyclopropane in accustomed hands ; or, where a non-explosive anæsthetic was needed, trichlorethylene and oxygen in a closed circuit. Chloroform was contra-indicated. Postoperative oxygen therapy was needed. Premedication should err on the side of underdosage, but the barbiturates were useful.

Dr. KENNETH ROBERTS, in a short paper on the rapidly acting barbiturates, with special reference to ' Pentothal Sodium,' described them as essential, either as basal or sole anæsthetics, in thoracic surgery.

DISEASES OF EAST AFRICA

Sir Philip Manson-Bahr sends us the following letter from his son, Major Clinton Manson-Bahr, M.R.C.P., E.A.A.M.C., dated Oct. 18, 1941.

I have just received the reprint of your *Lancet* article of May 10, and I thought you might like to hear how it has been borne out on the spot.

Malaria.—There is not much to remark on here, but on the way to Addis the species of malaria changed according to your description. At first in Addis the malaria was almost all subtertian, for the troops had passed through the malarious area (Diredawa to Awash) where the malaria is all of that variety. In the campaign in the Lakes the malaria was also subtertian, most of it coming from the unhealthy Omo river where there was some considerable fighting. With the finish of the fighting and the removal of troops, a change took place as we were draining local sick. The malaria became more and more benign tertian, and, as you say, *Plasmodium vivax* must undoubtedly exist in Addis Ababa since there were first infections in Europeans who had not been out of Addis for nearly three months. The development of the problem of *P. wilsoni* has been disappointing as Dr. Roberts has not received another specimen from inside Abyssinia yet. There was one doubtful one in Addis.

Leishmaniasis.—There has been an interesting development with regard to visceral leishmaniasis. In one company of K.A.R. there have been about 30 cases of undoubted kala-azar. While down in Kenya I saw a few of them at Nyeri and the crithidial forms had been cultured from one autopsy by Major Robertson, who was pathologist at Accra. He gave me a slide from the culture. These cases occurred in this company who were stationed north-east of Lake Rudolf in a completely uninhabited area where there were no natives or dogs. Symes, the Kenya entomologist, says that about 1926 a company of Sudanese Defence Force trekked down through this area to meet the K.A.R. and there was an outbreak of Kala-azar on their return to the Sudan. The case I found in an Arab in Garba Tulla in the Northern Frontier Province of Kenya, of whom I sent spleen smears to Major Robertson, was also positive for L.D. bodies. He had never been away from Garba Tulla. This was in September, 1940 ; Dr. Sequeira then found in the literature some 8 cases from the Northern Frontier district.

Relapsing fever.—The incidence of this has been, as you say, there being a change in the vector as you approach the highlands from the Somaliland desert. In fact there must be quite a sudden change as one approaches the Addis Ababa plateau. The Italians think it possible for the spirochæte to change its vector from the tick to the louse ; this is then followed by a change in virulence for the worse. Certainly the louse-borne form has been very virulent in our askaris and there have been plenty of deaths.

Yellow fever.—There have been several deaths (I have done a p.m. on two) with high fever and severe jaundice, and one case had had hæmatemesis. The blood smears and spleen smears were negative. Autopsy revealed a severe toxic jaundice with spontaneous rupture of the spleen in one case, looking just like a relapsing fever but no spirochætes to be found. I have kept some liver for section but this has not yet been done. I think they were relapsing-fever cases. I do not know their movements well but they had been in Addis for some time.

Typhus.—The typhus in Addis is, as you say, all louse borne, and many of the Italians die every year from it. But the Italians say the case-fatality is nothing like as high as in European epidemic typhus, being in the region of 30%. There is a seasonal recrudescence in September. Apparently also they get murine typhus in Southern Abyssinia and this is borne out by the fact that there is an increase of this disease when the rats are driven into the houses. There has been some trouble over murine typhus, as the South African XK suspension does not seem to be much good and has agglutinated much too frequently in some cases of relapsing fever. One of our medical officers contracted tick-borne typhus, developing it when he got to Addis. He must have contracted it in Somaliland. He had a local sore adenitis and considerable fever. His Weil-Felix showed some agglutination to all three strains but only in very low titres.

Dysentery.—The Italians swear there is no bacillary dysentery in the coastal Mogadishu region, but among some British sailors who were captured by a raider and left near Mogadishu a large number developed bacillary dysentery when we arrived. Also some British signallers when in camp just outside Mogadishu had a severe outbreak of bacillary dysentery, although there were no deaths. There is a fair amount in Addis, chiefly Flexner and non-specific types. There is also a fair amount of amœbiasis around Addis as many askaris came in with vegetative forms of *E. histolytica* in their stools presumably contracted in the locality.

Venereal disease.—I have just finished two months at the V.D. hospital where I worked with the Italian director of venerealogy. Soft sore is the commonest disease. I saw two pukka cases of lymphogranuloma inguinale, both from the Negheli region. The Italian doctor told me it occurred in Italian Somaliland, but not in Abyssinia proper. Granuloma veneteum occurs in the Gondar region and Western Abyssinia, but I never saw a case in Addis, even among the Abyssinians ; some were shown, but I am sure they were secondary syphilitic condylomata. The syphilis is just the same as the European disease, except that the secondary stage supervenes earlier and is more severe in the African. Askaris from areas where yaws occurs in our East Africa developed syphilis just the same. Mixed chancre was extremely common, the syphilitic being masked by the soft chancre, often to the detriment of the patient.

Helminthic diseases.—The Italian Dr. Pauli, who is an expert laboratory worker, says he has not seen *Bilharzia mansoni* in Abyssinia—in fact, he was very excited when shown some eggs in the fæces of some of our West Africans.

* * *

There is a pair of lesser kestrels just by my bedroom and I think they are going to nest. I have taken some ciné films of them, for they are very tame. By my book on birds (Jackson) and my glasses I think they are of the Eastern race.

LONDON COUNTY COUNCIL.—At the meeting of the council on Feb. 10 the civil defence and general purposes committee recommended that the council shall set up and operate on behalf of the Ministry of Health day nurseries in suitable rest centres for children between the ages of two and five years, whose mothers are engaged on war work or other whole-time employment. It is understood that the Ministry will probably ask for the establishment of some 50 nurseries with a daily attendance of up to 1000 children. One of the conditions attached to the recommendation is that the borough medical officers of health shall extend their medical oversight of rest centres to these nurseries.

The mental hospitals committee has recommended that from April 1, 1942, the weekly charge for rate-aided mental patients shall be increased by 3*s.* 6*d.* to 36*s.* 2*d.* a head. A similar adjustment will be made in the charge for " private list " cases.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—A meeting of this society will be held at 11, Chandos Street, London, W.1 on Thursday, Feb. 26 at 2.30 P.M., when Dr. J. H. Gould will read a paper on electrical convulsant thresholds.

Medical News

University of Cambridge

The titles of the degrees of M.B., B.Chir. have been conferred on Mrs. A. Davies.

On Feb. 6 the following degrees were conferred :—

M.D.—W. H. Valentine and E. T. C. Spooner.

M.B., B. Chir.—* E. V. Hope, * S. L. Melville, * G. C. Franklin, * A. H. Rea, * Noel Gillman, and G. F. Purves.

* by proxy.

Society of Apothecaries of London

The following having completed the final examination of the society have been granted its diploma entitling them to practise medicine, surgery and midwifery :—

C. N. d'E. Eastes, Guy's ; J. T. Hemmingway, Anderson Coll., Glasg. ; S. A. MacDonald, St. Thos. ; G. C. Kennedy, Guy's ; R. L. Skea, Guy's ; and C. R. Deuchar, Dubl.

Medical Superintendents Society

A meeting of the main executive committee of this society will be held at the Midland Hotel, Derby, on Saturday, Feb. 21, at 11.45 A.M. It will be followed by the annual meeting of the Midland branch at 2.30 P.M.

Glasgow Medico-Chirurgical Society

At a meeting of this society to be held on Wednesday, Feb. 18, at 7.30 P.M. in the Lister theatre of Glasgow Royal Infirmary, Mr. Norman Dott will speak on brain surgery in Britain, 1939–41.

Medical Casualties

In a recent casualty list the following R.A.M.C. officers have been posted as wounded : W.S/Captain Leonard Bapty, M.B. Aberd. ; W.S/Captain A. R. Duff, M.B. Edin. ; and T/Major W. G. Macfie, M.B. Glasg.

Nutrition Society

This society will hold a conference on food production and distribution in relation to nutritional needs on Saturday, Feb. 28, at the Dunn Nutritional Laboratory, Milton Road, Cambridge. Sir Wilson Jameson will take the chair at 10 A.M., and those who will read papers include, Sir John Orr (the agricultural implications of a food policy based on nutritional needs), Mr. N. C. Wright, D.Sc. (rival claims of animals and man for food), Mr. E. T. Halnan (animals as food-converters) and Sir John Russell, F.R.S. (planning for agricultural production). Provisional arrangements have been made for further meetings when the preparation of food in war-time and nutritional requirements for optimal health will be discussed.

Royal Sanitary Institute

A meeting of the institute will be held at the Nuffield Institute of Clinical Research, Oxford, on Saturday, Feb. 28, at 10 A.M., when Mr. H. H. Crawley, A.M.Inst.C.E., deputy water engineer for the borough, will speak on the storage of emergency drinking supplies. Mr. Stewart Swift, chief sanitary inspector and evacuation officer for the borough, will describe the administration of the Government evacuation scheme, and Dr. H. C. Jennings, county medical officer of health will open a discussion on the scheme. Further information may be had from the local secretary for the meeting, Dr. G. C. Williams, Greyfriars, Paradise Street, Oxford.

Royal Society of Medicine

The section of comparative medicine of this society will meet on Wednesday, Feb. 18, at 2.30 P.M., for the third discussion in the series on the control of diseases of cattle inimical to man, when Mr. A. W. Stableforth, D.Sc., Dr. V. D. Allison and Mr. S. L. Hignett will speak on mastitis and streptococcal infection. At 2.30 P.M., on the same day, the section of psychiatry has arranged a symposium on the assessment of mental responsibility with special reference to the armed forces. Those taking part will include Brigadier H. Shapcott, Air-Commodore H. L. Burton, M.B., Surgeon Lieut.-Commander E. W. Anderson and Major E. A. Bennet. On Feb. 19, at 2.30 P.M., at the section of neurology, Dr. J. G. Greenfield, Major Ritchie Russell and Dr. J. Hamilton Paterson will open a discussion on cerebral œdema. On Feb. 20, at 2.30 P.M., short papers will be read at the section of obstetrics and gynæcology, and at the same time at the section of physical medicine Dr. J. L. Halliday is opening a discussion on the psychological aspect of rheumatoid arthritis. The section of orthopædics will meet on Feb. 21 at 11.15 A.M., at the Royal National Orthopædic Hospital, Brockley Hill, Stanmore.

Chadwick Lectures

The following lectures have been arranged by the Chadwick Trust for the coming months: Tuesday, Feb. 24, at 2.30 P.M., Mr. W. G. Culpin, F.R.I.B.A., reconstruction after the war (at 26, Portland Place, London, W.1) ; March 17, 2.30 P.M., Dr. W. A. Brend, nervous shock in peace and war (London School of Hygiene, Keppel Street, W.C.1) ; April 14, 2.30 P.M., Mr. D. C. Graham, M.Inst.C.E., dangers from rainfall in urban areas (Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1) ; May 12, 2.30 P.M., Dr. Alison Glover, the school medical service in war-time (26, Portland Place, W.1) ; June 18, 4 P.M., Mr. E. Augustus Bowles, plants in relation to food, medicine, or poison (Chelsea Physic Garden, Swan Walk, S.W.3). Further particulars of these lectures may be had from the secretary of the trust, 204, Abbey House, Westminster, S.W.1.

Thanks a Lot

Mr. Ernest Brown has written to thank the American Ambulances of Great Britain for the help they are giving us. Up to the end of November the fleet of ambulances, which reached its full complement of some 270 vehicles last August, had travelled over three million miles. At present it carries about 2500 hospital patients a week, and also provides speedy transport for teams of consultants and for the blood transfusion services. Surgeon Rear-Admiral G. Gordon-Taylor who is on a visit to America has also paid a tribute to the work of the service, especially for its help in salvaging the Hunterian collection when the College of Surgeons was bombed last year.

Births, Marriages and Deaths

BIRTHS

ABRAHAM.—On Feb. 3, at Harpenden, the wife of Surgeon Lieutenant J. C. G. Abraham, R.N.V.R.—a daughter.

COOPE.—On Feb. 6, the wife of Dr. Robert Coope, of Liverpool—a son.

COUTTS.—On Feb. 1, at Chesham Bois, Bucks, the wife of Lieut.-Colonel J. C. Coutts, R.A.M.C.—a son.

CRAIG.—On Feb. 5, the wife of Dr. J. W. Craig, of Haslemere—a son.

EVANS.—On Feb. 2, to Dr. Barbara Evans (née Hay-Cooper), wife of Dr. Philip Evans, of Anstye, Cuckfield, Sussex—a son.

NEILL.—On Feb. 2, at Leicester, the wife of Captain J. H. Neill, R.A.M.C.—a daughter.

RIDLEY.—On Feb. 8, at Woking, the wife of Mr. Harold Ridley, F.R.C.S.—a daughter.

SHARP.—On Feb. 6, at Epping, the wife of Dr. Edward Sharp—a son.

MARRIAGES

CADMAN—HAWKINS.—On Feb. 7, at Wellington, Shropshire, Donald Spencer Cadman, M.B. to Mary Sylvia Hawkins.

HENDERSON—MORTON.—On Feb. 7, at Warblington, Hampshire, Peter Wallace Henderson, B.M., to Stella Dolores Morton, B.M.

JOHNSTON—PETERS.—On Jan. 28, at Basingstoke, Charles Leslie Johnston, M.R.C.S., to Kathleen Peters.

THOMSON—STEWART.—On Jan. 31, in London, Colin Thomson, M.B., Captain R.A.M.C., to Lesley Isabel Stewart, M.B., flying-officer, R.A.F.

VAN DE LINDE—GIBSON.—On Feb. 7, at West Horsley, Patrick Van de Linde, M.B., to Annie Brayshay Gibson.

DEATHS

CATO.—On Jan. 30, at King's College Hospital, Alexander McLean Cato, M.B.C.S., of Stanstead Road, Forest Hill, London, S.E. 23.

JOHNSTON.—On Feb. 1, at Strabane, N. Ireland, William Thomas Johnston, M.D. R.U.I., lieut.-colonel, R.A.M.C., retd.

MACKEITH.—On Feb. 5, at Church Hill, Aldershot, Malcolm Henry MacKeith, D.M. OXFD, M.R.C.P., aged 46.

MORLEY.—On Feb. 3, Frank Morley, M.R.C.S., L.D.S., of Randolph Crescent, Maida Vale.

ROBINSON.—On Feb. 7, at West Byfleet, William Moore Skipworth Robinson, F.R.C.S.E.

STATHERS.—On Feb. 6, at Brackley, George Nicholson Stathers, M.R.C.S., D.P.H., aged 84.

WOODCOCK.—On Feb. 3, at Hove, Sussex, Harold Brookfield Woodcock, M.B.E., M.B. MANC.

Appointments

AYRES, G. W., M.B. LOND. : examining factory surgeon for Chippenham, Wilts.

BURGES, R. C. L., M.B. CAMB. : examining factory surgeon for Birmingham North.

D'AMIAN, ELSE A., L.R.C.P.E. : temp. asst. M.O.H. for Rawtenstall.

PARIKH, STELLA A., M.B. LOND. : asst. M.O. at Hastings Municipal Hospital.

PATTERSON, ELEANOR, M.B., B.HY. DURH., D.P.H. ; temp. asst. M.O.H. and asst. school M.O. for Reigate.

SWAN, J. F., M.B. GLASG., D.P.H., D.R.C.O.G. : asst. M.O.H. for Manchester.

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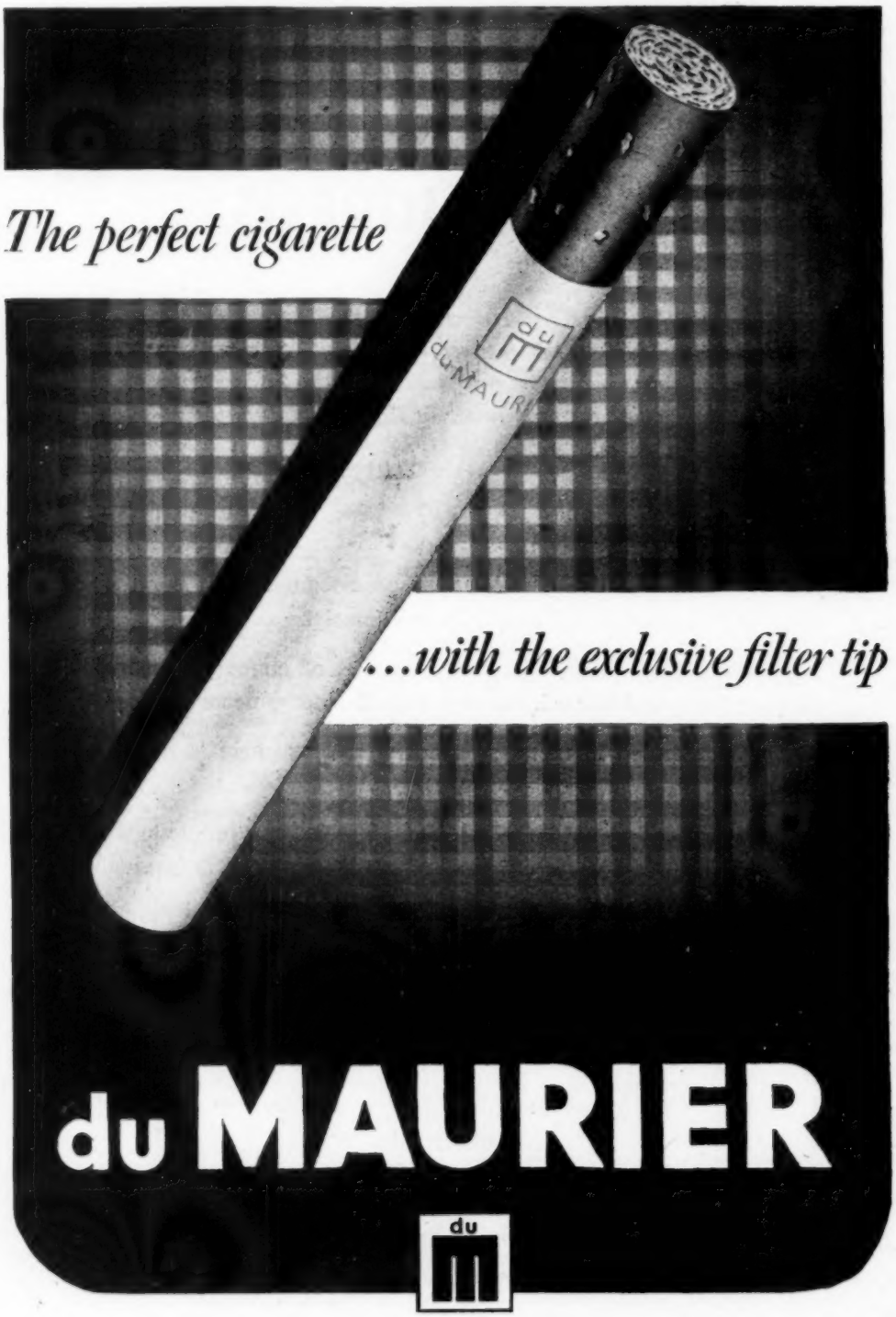
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STATEMENT OF ACCOUNTS

December 31, 1941

LIABILITIES	£
Capital paid up	15,158,621
Reserve Fund	12,410,609
Current, Deposit and other Accounts	687,206,091
Acceptances and Confirmed Credits	4,886,593
Engagements	9,815,130

ASSETS	
Coin, Notes and Balances with Bank of England	75,553,266
Balances with, and Cheques on other Banks	30,257,946
Money at Call and Short Notice	22,214,419
Bills Discounted (British Treasury Bills £30,196,989)	33,461,839
Treasury Deposit Receipts	159,000,000
Investments	206,146,013
Advances and other Accounts	169,812,486
Liabilities of Customers for Acceptances, etc.	14,701,723
Bank Premises	9,089,436
Shares in Yorkshire Penny Bank Ltd.	937,500
Shares in Affiliated Companies: Belfast Banking Co. Ltd. ... The Clydesdale Bank Ltd. ... North of Scotland Bank Ltd. ... Midland Bank Executor and Trustee Co. Ltd. ...	8,302,416

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STATEMENT OF ACCOUNTS. 31*st December*, 1941

LIABILITIES

	£	£
Current, Deposit and other Accounts, including Reserve for Taxation and Contingencies and Balance of Profit and Loss	629,650,012	
Balances in account with Subsidiary Banks	15,535,385	
		645,185,397
Acceptances and Endorsements, &c., for account of Customers		12,872,411
Paid-up Capital		15,858,217
Reserve Fund		11,250,000

ASSETS

		£
Cash in hand and with the Bank of England		70,617,711
Balances with other British Banks and Cheques in course of collection		27,815,694
Money at Call and Short Notice		24,917,550
Bills Discounted		40,343,437
Treasury Deposit Receipts		152,000,000
Investments		168,219,936
Investments in Subsidiary Banks (at cost, *less* amounts written off) :—		
The British Linen Bank—£1,241,044 12s. 6d. Stock		3,723,134
Other Banks—(including fully paid Stock and 500,000 "B" Shares of £5 each, £1 per Share paid up, in Barclays Bank (Dominion, Colonial and Overseas) and 1,000,000 Shares of £1 each, 5s. per Share paid up, in Barclays Bank (France) Limited)		2,484,010
Advances :—Customers and other Accounts	173,321,065	
Balances in account with Subsidiary Banks	913,412	
		174,234,477
Liability of Customers for Acceptances and Endorsements, &c.		12,872,411
Bank Premises and Adjoining Properties (at cost, *less* amounts written off)		7,937,665

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WAR SURGERY OF NERVOUS SYSTEM

2nd to 6th March, 1942

Monday, 2nd March	10 A.M.	The Surgical Anatomy of the Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	10.30 A.M.	(*a*) Mechanism and Nature of the Injuries of the Skull. (*b*) Mechanism and Nature of the Concomitant Injury to the Brain.	Mr. G. C. Knight, F.R.C.S.
	2 P.M.	Demonstrations on the Cadaver of Operations on Skull and Brain.	Mr. A. K. Henry, F.R.C.S.
Tuesday, 3rd March	10 A.M.	(*a*) Closed Injuries of Skull and Brain: their Complications and Management. (*b*) Immediate Treatment and Management of Wounds of Skull and Brain.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
	2 P.M	Pathology of Wounds of the Nervous System.	Dr. J. G. Greenfield, M.D., F.R.C.P.
Wednesday, 4th March	10 A.M.	Surgical Sequelæ of Wounds of Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	12.15 P.M.	Use of X-rays in the Diagnosis of Head Injuries.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Disorders following Head Injuries.	Dr. J. Purdon Martin, M.D., F.R.C.P.
	3.15 P.M.	Hysterical Disorders Associated with War Wounds.	Dr. Aubrey Lewis, M.D., F.R.C.P.
Thursday, 5th March	10 A.M.	Some Sequelæ of War Wounds of Skull and Brain.	Mr. Harvey Jackson, F.R.C.S.
	11.30 A.M.	War Injuries of the Spinal Cord.	Prof. Lambert Rogers, F.R.C.S., F.A.C.S., F.R.A.C.S.
	1.30 P.M.	X-rays in War Injuries of the Spine.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Demonstration on the Cadaver of Operations on the Spine.	Mr. A. K. Henry, F.R.C.S.
Friday, 6th March	10 A.M.	Peripheral Nerve Injuries: (1) Diagnosis.	Prof. H. J. Seddon, D.M., F.R.C.S.
	11.30 A.M.	Peripheral Nerve Injuries: (2) Treatment.	Prof. H. J. Seddon, D.M., F.R.C.S.
	2.15 P.M.	Possibilities of Nerve Grafting.	Mr. F. H. Bentley, F.R.C.S.
	3.15 P.M.	Care of Bladder in Injuries of the Nervous System.	Mr. C. Morson, O.B.E., F.R.C.S.

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Last date for receiving entries: Monday, 23rd February.

FIRST EXAMINATION (Anatomy, Physiology, and Pharmacology)—MONDAY, 30TH MARCH.
Last date for receiving entries: Monday, 9th March.

FINAL EXAMINATION (Pathology, Medicine, Surgery, and Midwifery)—WEDNESDAY, 8TH APRIL.
Last date for receiving entries: Wednesday, 18th March.

Subject to there being a sufficient number of candidates desiring to take the examinations outside the London area, arrangements have been made to conduct the examinations at MANCHESTER, in addition to LONDON.

Candidates who desire to present themselves for any of these examinations must give notice in writing to the Secretary, Examination Hall, Queen-square, London, W.C.1, in sufficient time for such notice to reach him by the last date for receiving entries as stated above, transmitting at the same time such certificates as may be required by the regulations of the Board.

Candidates must state, when submitting their entries, at which centre (London or Manchester) they desire to be examined, and must remit at the same time the appropriate application fees, together with the local fee in the case of Manchester—namely, 15s. per subject of the Pre-medical Examination, or 21s. per subject of the First and Final Examinations.

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One remittance to include both application and local fees may be sent, and all remittances must be made payable to "The Examining Board in England," and should be crossed "Barclays Bank."

In the event of the arrangements at Manchester having to be cancelled the local fees will be returned.

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Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens. Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An Illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON, and is 200 ft. above sea-level

THE LAW NURSING HOME

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Founder: The late SIR A. J. LAW, J.P., M.P.

A Private Hospital, exclusively for the treatment of POST-ENCEPHALITIC PARKINSONISM, PARKINSON'S DISEASE and ALLIED DISORDERS

The Nursing Home is governed by Trustees; any surplus is utilized to help patients who cannot afford full fees. Extensive grounds. Hydro. Expert Massage and Physical re-education. Dietary treatment. Equipped with every laboratory apparatus for the investigation and treatment of the diseases. Results of the BULGARIAN TREATMENT published (*Lancet*, 1939, I, 693) approx.: 300 patients treated in the last 3 years. Terms moderate. Further particulars apply Medical Superintendent. Tel.: Rochdale 2960.

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FOR NERVOUS AND MENTAL DISORDERS

Cases of Alcoholism and Drug Addiction are admitted. Every facility for individual treatment on the most modern lines. Special Department for Insulin Therapy. Fully equipped Gymnasium, Golf Course, and Indoor Swimming Pool. Specially trained Occupational and Recreational Therapists.

Medical Certificates given anywhere in the British Isles are valid for admission of patients.

Physician Superintendent: P. K. McGOWAN, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. Telephone: Dumfries 1119.

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Telephone: 3216 & 3217

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS

Extensive grounds. Detached Villas. Chapel. Garden Produce from own gardens. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH

standing in 12 acres of ornamental grounds, with separate villas, tennis courts, etc. Patients or Boarders may visit the Home by arrangement.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury.

TOR-NA-DEE SANATORIUM

Managing Director: DAVID LAWSON, M.D., F.R.S.E.

FOR THE TREATMENT OF PULMONARY TUBERCULOSIS AND ALLIED DISEASES

Medical Superintendent: R. Y. KEERS, M.D. (Edin.)

For prospectus apply to The Secretary, Tor-na-Dee, Murtle, Aberdeenshire Telephone: Cults 107

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-ray plant. Every facility for Artificial Pneumothorax and for operations on the Chest. Electric Lighting. Central Heating.

For particulars apply to Medical Superintendent.

H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall Ruthin, N. Wales.

CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

SPRINGFIELD HOUSE

Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

FENSTANTON

at "FIVE DIAMONDS," Chalfont St. Giles, Bucks

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (See *Medical Directory*, p. 2362.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

ROYAL EARLSWOOD INSTITUTION

REDHILL, SURREY

For MENTAL DEFECTIVES of all ages

Training under medical supervision. Schools, Farm, Trade Workshops, Recreations. Fees £110 to £375 p.a. Election by votes of subscribers at reduced terms for necessitous trainable cases.

Apply, Secretary. Tel.: Redhill 344.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)

MAGHULL (near LIVERPOOL)

FARMING and OPEN AIR OCCUPATION for PATIENTS

A few vacancies in 1st and 2nd Class Houses.

FEES: 1st Class (men only) from £3 per week upwards.
2nd Class (men and women) 32/- per week.

For further particulars apply: C. EDGAR GRISEWOOD, A.C.A. Secretary, 20, Exchange Street East, Liverpool, 2

THE GROVE HOUSE,

CHURCH STRETTON, SHROPSHIRE.

Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.

Medical Superintendent: Dr. J. A. McCLINTOCK.

The Royal Cancer Hospital (Free)

(Incorporated under Royal Charter),
Fulham-road, London, S.W.3.

The Committee are prepared to receive applications for the post of DIRECTOR OF THE PATHOLOGICAL DEPARTMENT. Experience in Clinical Pathology essential. Salary £1000 per annum. The appointment is a temporary one and terminable within twelve months of the conclusion of hostilities. The appointment is subject to rules, a copy of which can be obtained from the Secretary.

Applications, accompanied by copies of not more than three recent testimonials, to be sent to the Secretary not later than Monday, 9th March, 1942. CLEMENT COBBOLD, Secretary.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL AND ORAL COACHING

FOR

ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages),

sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6313.)

Charing Cross Hospital.

MEDICAL REGISTRAR (RESIDENT).

Applications are invited from registered medical practitioners (Male) for the above B1 appointment. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Minimum commencing salary £350 per annum.

Applications, together with copies of three testimonials, should be sent, to arrive not later than first post 16th February, 1942, to: GEORGE J. JONES, Secretary.

Bolingbroke Hospital,

Wandsworth Common, S.W.11.

Applications are invited from registered medical practitioners (Male) for the appointment of—

(1) HOUSE SURGEON (B2), including R practitioners who now hold A posts. Salary is at the rate of £200 per annum, with full residential emoluments. The present Casualty Officer is a candidate for this post.

(2) CASUALTY OFFICER (unmarried) (A). Salary is at the rate of £120 per annum, with full residential emoluments. R practitioners within three months of qualification may apply.

The appointments will be for six months commencing 1st March, 1942.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent on or before the 18th February, 1942, to: W. S. RANDOLPH BISS, Secretary-Superintendent.

31st January, 1942.

Borough of Ealing.

Applications are invited from duly qualified medical practitioners with a public health qualification for the position of ASSISTANT MEDICAL OFFICER OF HEALTH.

A candidate must have had at least three years' experience in the practice of the profession. The person appointed will be required to carry out medical inspection of school-children and child welfare work, and perform such other duties as may be allotted as Assistant to the Medical Officer of Health and School Medical Officer.

The person appointed will be required to devote their whole time to the duties and will not be allowed to engage in private practice. The salary will be at the rate of £600 per annum, rising by £25 per annum to £700.

A deduction will be made from the salary in accordance with the provisions of the Local Government Officers' Superannuation Act, 1937, and the appointment will be subject to passing the Council's medical examination in connexion therewith. Canvassing will be a disqualification.

Copies of the application forms and terms of appointment can be obtained from Dr. Thomas Orr, Medical Officer of Health, Town Hall, Ealing, W.5, to whom application, accompanied by copies of not more than three recent testimonials, must be delivered not later than the 27th February, 1942.

R. H. WANKLYN, Town Clerk.

Town Hall, Ealing, W.5, 13th February, 1942.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for STAINES COUNTY HOSPITAL, Ashford, Middlesex. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had experience in treatment of pulmonary tuberculosis. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Application, stating age, nationality, qualifications with dates, experience, and details of previous appointment, to the undermentioned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 28th February, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

The Queen's Hospital for Children,

Hackney-road, E.2.

RESIDENT MEDICAL OFFICER required 17th March, 1942 (B2 post). Applications are invited from registered medical practitioners, including R practitioners holding A posts when appointment will be limited to six months, otherwise renewable for subsequent similar periods. Salary at rate which with certain additions will amount to not less than £250 per annum, with board, lodging, and laundry. Candidates must be prepared to participate in the Emergency Hospital arrangements in connexion with which beds are reserved.

Applications must be made on forms to be obtained from the undersigned, and should be sent in, with copies of not more than three testimonials, on or before 23rd February, 1942.

CHARLES H. BESSELL, Secretary.

Mount Vernon Hospital and the

RADIUM INSTITUTE, NORTHWOOD.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), to become vacant on 20th March next. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise it may be extended for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 18th February to—

F. A. WATSON, Secretary.

County Borough of Middlesbrough.

The Middlesbrough Corporation invites applications from registered medical practitioners (Women) for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH, Maternity and Child Welfare.

Applicants must have had experience in antenatal work, midwifery, and diseases of children, with not less than three years' postgraduate experience.

Commencing salary will be at the rate of £550 per annum, with residence, board, and laundry valued at £150, making £700 in all, and rising, subject to satisfactory service, by annual increments of £50 to a maximum of £850.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the regulations governing conditions of service made by the Middlesbrough Corporation. The successful candidate will be required to pass a medical examination.

The successful candidate will be required to reside at the Municipal Maternity Hospital, and to devote the whole of her time to the duties of the office, and to act under the direction of the Medical Officer of Health.

Applications, stating age and experience, together with copies of three recent testimonials, must be sent to the Medical Officer of Health, Municipal Buildings, Middlesbrough, immediately.

PRESTON KITCHEN, Town Clerk.

Municipal Buildings, Middlesbrough, 29th January, 1942.

Royal Gwent Hospital, Newport, Mon.

(Total 341 Beds.)

Applications are invited from registered practitioners, Male or Female, for the appointment, which falls vacant on 28th February, of THIRD HOUSE SURGEON (A). R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, and details of previous appointments (if any), accompanied by copies of three recent testimonials, should be sent at once to: ALAN RUDDLE, Secretary-Superintendent.

6th February, 1942.

West Cornwall Hospital, Penzance.

(Total 186 Beds.)

Applications are invited from registered medical practitioners, Male, for the appointment of HOUSE SURGEON (A), to become vacant on 20th February, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to—

K. I. NEWELL, Secretary-Superintendent.

East Suffolk and Ipswich Hospital,

IPSWICH. (400 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1) to this Hospital and Medical Superintendent to the Branch Hospital (50 Beds), vacant 10th March, 1942. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The minimum salary is £350, or according to qualifications and experience.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to: ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 14th February, 1942.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

City of Birmingham.

SELLY OAK HOSPITAL AND INFIRMARY. (1200 Beds.)

Applications are invited from registered medical practitioners for the appointment of TEMPORARY SURGEON (B1) (Resident). Applicants must have had experience in general surgery and ear, nose, and throat work. Suitably qualified R practitioners holding B2 or B1 posts may apply. The salary will be at the rate of £10 10s. per week, plus residential emoluments. The appointment will be terminable by one month's notice on either side. Further particulars of the appointment may be obtained from the Medical Officer of Health.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, Council House, Congreve-street, Birmingham, 3, not later than the 5th March, 1942.

City of Birmingham.

MATERNITY AND CHILD WELFARE DEPARTMENT.

BABIES' HOSPITAL, CANWELL HALL. (84 Beds.)

A RESIDENT MEDICAL OFFICER (B1) is required on 9th March, 1942, for a period of six months. Suitably qualified R practitioners holding B2 or B1 posts may apply. The Hospital deals with children under five years of age suffering with acute and chronic medical conditions. The Resident Medical Officer will also be required to take two child welfare sessions weekly at the Maternity and Child Welfare Centres in the City of Birmingham. Salary £350 per annum, with board, residence, and laundry.

Applications, with copies of three testimonials, to be sent on or before 25th February, 1942, to the MEDICAL OFFICER OF HEALTH, The Council House, Congreve-street, Birmingham, 3.

Royal Lancaster Infirmary,

LANCASTER. (267 Beds.)

(Five Resident Officers. Hospital recognised by the Royal College of Surgeons (England) for Two Senior Posts.)

JUNIOR HOUSE SURGEON (A) (general duties), also HOUSE PHYSICIAN (A), required immediately. Salaries £130 per annum, with board, residence, and laundry. R practitioners within three months of qualification may apply. Appointment is for six months.

Applications, stating age, qualifications, experience, and nationality, together with copies of three recent testimonials, to be sent immediately to—

FRANK A. MILNES, Superintendent-Secretary.

Cardiff Royal Infirmary.

(GENITO-URINARY DEPARTMENT.)

Applications are invited from registered medical practitioners, Male, for the appointment of a HOUSE SURGEON (A), to become vacant immediately. R practitioners within three months of qualification may apply.

The appointment will be for six months and the salary is at the rate of £50 per annum, with full residential emoluments.

Application forms may be obtained from—

R. ARMSTRONG, Medical Superintendent.

Royal Eye and Ear Hospital, Bradford.

(94 Beds.)

HOUSE SURGEON (A) (Male or Female) wanted for 1st April. R practitioners within three months of qualification may apply. Salary £180 per annum, with board, residence, and laundry. If held by an R practitioner the appointment will be for a period of six months.

Applications, stating age, nationality, with copies of recent testimonials, to be sent to—

ERNEST S. HEAP, Secretary-Superintendent.

Surrey County Council.

EDUCATION COMMITTEE. CHILD GUIDANCE CLINICS.

Applications are invited for appointment as Part-time PSYCHIATRIST. Remuneration three guineas per session (two sessions per week), plus travelling expenses according to the Council's scale.

The officer appointed will be required to take up duty on 1st April, 1942, or as soon as possible thereafter.

The appointment is subject to the approval of the Board of Education, and to the staffing regulations of the County Council.

Applications, stating age and qualifications, with details of experience, together with copies of three recent testimonials, should be sent to the Chief Education Officer at the undermentioned address not later than 21st February, 1942.

DUDLEY AUKLAND, Clerk of the Council.

County Hall, Kingston-upon-Thames.

Gloucestershire County Council.

Gloucestershire County Council invite applications for the appointment of a TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH at a salary of £500 per annum. Applicants must be registered medical practitioners and should hold a Diploma in Public Health. The appointment will be subject to a satisfactory medical report by the Council's Medical Adviser.

Forms of application, with particulars of the duties and conditions of appointment, may be obtained from the County Medical Officer of Health, 18, Berkeley-street, Gloucester, to whom completed applications, with copies of three recent testimonials, should be sent not later than the 28th February. Canvassing, directly or indirectly, will disqualify.

RICHARD L. MOON, Clerk of the County Council.

Hampshire County Council.

THE COUNTY COUNCIL HOSPITAL, CLAYHALL-ROAD, ALVERSTOKE, GOSPORT. (61 Beds.)

ASSISTANT RESIDENT MEDICAL OFFICER required at the above Hospital at a salary of £350 per annum (B2). R practitioners holding A posts may apply when appointment will be limited to six months. Must have held a resident surgical hospital appointment and be experienced in administering anæsthetics.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

Victoria Hospital, Burnley.

(169 Beds.)

Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE PHYSICIAN (A), to become vacant immediately. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

J. E. WHEATCROFT, Secretary.

Dorset Mental Hospital,

HERRISON, DORCHESTER.

TEMPORARY ASSISTANT MEDICAL OFFICER (B1) OR LOCUM TENENS.

Applications are invited from registered medical practitioners for the above whole-time appointment. R practitioners holding B2 or B1 appointments may apply. Salary at the rate of £400 per annum, with the usual residential emoluments. Additional £50 if holder of the D.P.M.

Apply, with copy of testimonials, to the MEDICAL SUPERINTENDENT.

City of Leeds.

PUBLIC HEALTH DEPARTMENT.

(*AMENDED ADVERTISEMENT.*)

Applications are invited from qualified and registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER for Maternity and Child Welfare. Applicants must have had not less than three years' postgraduate experience, including experience in general medicine and surgery, and special experience in obstetrics and antenatal work, and in the treatment of children's diseases and diseases of women. Preference will be given to candidates possessing the D.P.H.

The commencing salary for the post will be not less than £600 per annum, and the present grading scheme of the Corporation provides for annual increments of £25 to a maximum of £700. In determining the commencing salary due consideration will be given to previous experience and qualifications. The first increment will take effect on the 1st April following the completion of twelve months' service.

The person appointed will be required to pass a medical examination and to contribute to the Superannuation Fund established under the Local Government Superannuation Act, 1937. The appointment will be terminable by one month's notice on either side.

Form of application and particulars as to the duties of the appointment may be obtained from the undersigned.

Applications, endorsed "Maternity and Child Welfare Officer," together with copies of three recent testimonials, must be delivered at the Health Department, 12, Market-buildings, Vicar-lane, Leeds, 1, not later than 10 A.M. on Monday, 23rd February, 1942.

Canvassing in any form, either directly or indirectly, will be a disqualification.

J. JOHNSTONE JERVIS, Medical Officer of Health.

City and County of the City of Exeter.

Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH (Woman) for the City and County of the City of Exeter at a salary of £500 per annum, rising by annual increments of £25 to a maximum of £700 per annum. The appointment is to the permanent staff of the Council, and the successful candidate will be required to pass a medical examination and to contribute to the Superannuation Fund.

The appointment may be determined by either party at any time by three months' notice in writing.

The main duties will be in connexion with the school medical and maternity and child welfare services of the Council, but the officer appointed will be required to undertake such other public health duties as may be allotted to her.

Canvassing, either directly or indirectly, will disqualify.

Applications, endorsed "Assistant Medical Officer of Health," accompanied by copies of three recent testimonials, must be received by me not later than the 18th February, 1942.

Application forms and particulars of the appointment may be obtained from: C. J. NEWMAN, Town Clerk.

10, Southernhay West, Exeter, 30th January, 1942.

County Borough of Blackburn.

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the post of RESIDENT JUNIOR ASSISTANT MEDICAL OFFICER (A) at QUEEN'S PARK HOSPITAL AND INSTITUTION, Blackburn, at a salary of £200 per annum, together with board, apartments, and attendance. The appointment will be limited to a term not exceeding one year, or if an R practitioner is appointed a period of six months.

Further particulars may be obtained from the Public Assistance Officer, Cardwell-place, Blackburn, to whom applications, stating age, qualifications, and experience, accompanied by copies of three recent testimonials, must be sent.

Blackburn. CHAS. S. ROBINSON, Town Clerk.

The Prince of Wales's Hospital,

Greenbank-road, PLYMOUTH.

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A), to become vacant on 4th March. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £132 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 18th February to—

ARTHUR R. CASH, General Superintendent.

27th January, 1942.

Borough of Llanelly.

ASSISTANT (LADY) MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER.

The Town Council invite applications for the above whole-time appointment from duly qualified single Lady medical practitioners. Applicants must have had at least three years' experience in the medical profession and special experience in midwifery and child welfare work. Possession of the Diploma of Public Health will be an advantage.

Salary £500, increasing by annual increments of £25 to £700 per annum.

The officer will be required primarily to carry out duties relative to Maternity and Child Welfare and School Children, and any assigned work in connexion with the Medical Services of the Borough under the direction of the Medical Officer of Health.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the successful applicant passing a satisfactory medical examination.

Prescribed application forms may be obtained from the undersigned, and when sent in should be endorsed "Assistant Medical Officer" and addressed so as to be delivered on or before the 25th February, 1942, to

DAVID J. PHILLIPS, Town Clerk.

Town Hall, Llanelly, 3rd February, 1942.

Hull Royal Infirmary.

Applications are invited from registered medical practitioners for the following posts which will become vacant in April:—

PARENT HOSPITAL: (1) HOUSE SURGEON (B2).
(2) CASUALTY OFFICER (A).

SUTTON BRANCH HOSPITAL: (3) HOUSE PHYSICIAN (B2).
(4) HOUSE SURGEON (B2).

R practitioners holding A posts may apply for the B2 appointments which will be limited to six months, and those within three months of qualification for the A post for a period of six months.

Posts (1) and (4) are recognised for the F.R.C.S. examinations and post (3) is recognised for the M.D. (London) examination.

The salary for each post is at the rate of £175 (plus £25 war bonus) per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent to: R. J. CARLESS, House Governor.

Holland County Council.

Applications are invited from registered medical practitioners, Male or Female, for the temporary whole-time appointment of ASSISTANT MEDICAL OFFICER OF HEALTH. The officer appointed will be employed on general duties, including school inspections and welfare centres in connexion with the work of the Health Department, and supervision of a small E.M.S. Hospital, under the direction of the Medical Officer of Health. The appointment is subject to one month's notice on either side. Salary will be at the rate of £600 per annum, and car allowance will be paid on the Council's scale.

Applications, together with copies of three recent testimonials, should be sent to the Medical Officer of Health, County Hall, Boston, on or before Tuesday, 17th February, 1942.

H. C. MARRIS, Clerk of the County Council.

County Hall, Boston, 31st January, 1942.

Rochdale Infirmary and Dispensary,

LANCS. (110 Beds.)

The Board of Management invites applications for the appointment of HOUSE SURGEON (A), appointment now vacant, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary attached to the appointment is at the rate of £150 per annum, including board, residence, and laundry.

Applications, stating age, nationality, &c., together with copies of three recent testimonials, to be sent to the Secretary. The successful candidate must be a member of a Medical Defence Society. W. WYNNE, Secretary.

Infirmary Office, Rochdale.

The Royal Hospital, Wolverhampton.

(Incorporated under Royal Charter.)
(310 Beds.)

Applications are invited for the post of RESIDENT SURGICAL OFFICER (B1). Salary £250 per annum. Experience in major surgery essential. The successful candidate must hold one of the higher qualifications in Surgery. Suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, with copies of testimonials, to be forwarded forthwith to— W. H. HARPER, House Governor.

ESTABLISHED 1885

The Medical Defence Union

EDGware 1373

Annual Subscription £1 MEMBERSHIP EXCEEDS 24,000 Assets exceed £100,000

No entrance fee payable by those joining within twelve months of registration

FULL PARTICULARS FROM THE SECRETARY, THE MEDICAL DEFENCE UNION LTD., "BONNINGTON," EDGWARE, MIDDLESEX

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City and County of Newcastle upon TYNE.

NEWCASTLE GENERAL HOSPITAL. (900 Beds.)
SHOTLEY BRIDGE HOSPITAL. (900 Beds.)

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners for the above appointments, including R practitioners within three months of qualification. The appointments will be tenable for a period of six months. Salary £150 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Royal United Hospital, Bath.

Applications are invited from registered medical practitioners (Male), including R practitioners within three months of qualification, for the following appointments, which become vacant on the dates stated :—

HOUSE SURGEON (A) (General Surgery and Ear, Nose, and Throat). 1st March.
HOUSE SURGEON (A) (General Surgery). 1st March.

Salaries at the rate of £150 per annum, with board, residence, and laundry. R practitioner appointments will be for a period of six months.

Applications (clearly indicating the post desired), stating age, qualifications, and experience, together with a copy of three testimonials, to reach the undersigned by 19th February, 1942.

J. LAWRENCE MEARS, Secretary-Superintendent.

20th January, 1942.

Burton-on-Trent General Infirmary.

Applications are invited from registered medical practitioners (Male) for the appointment of CASUALTY OFFICER AND HOUSE PHYSICIAN (A), including R practitioners within three months of qualification when appointment will be for six months. Salary at the rate of £150 per annum, with usual emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to—

E. W. THORNLEY, Superintendent and Secretary.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following appointments : (1) CASUALTY HOUSE SURGEON (A) (Male), and (2) HOUSE SURGEON (A) (Male). Required immediately. The appointments are for six months. Salary at the rate of £175 per annum, with residence, board, and laundry. This large industrial area offers excellent opportunity for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent immediately to—

R. LANCASTER, Secretary-Superintendent.

The Duchess of York Hospital

FOR BABIES, MANCHESTER, 19. (80 Cots.)

Applications are invited for the post of JUNIOR RESIDENT MEDICAL OFFICER (A), including R practitioners within three months of qualification, for six months from 1st April, 1942. Salary at the rate of £100 per annum, with full residential emoluments.

Applications, accompanied by copies of three recent testimonials, to be sent by 24th February, 1942, to—

LOUISE GILLESPIE, Secretary.

East Suffolk and Ipswich Hospital.

(407 Beds—8 Residents.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the appointment of HOUSE SURGEON (A).

The appointment is for six months. Salary at the rate of £144 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to: ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 14th February, 1942.

The Chester Royal Infirmary.

(Normal Capacity 225 Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of GENERAL HOUSE SURGEON (A), to take up duty forthwith. R practitioners within three months of qualification may apply when appointment will be for a period of six months. The vacancy has been caused by the illness of the present holder. The appointment is approved in connexion with the M.S. (London University) and the F.R.C.S. (England) examinations. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 26th February, 1942, to—

W. H. GRACE, M.D., F.R.C.P.,
Hon. Secretary, Medical Committee.

The Children's Hospital, Sheffield (Inc.)

(157 Beds.)

Applications are invited from registered medical practitioners Male and Female (including R practitioners within three months of qualification), for the appointment of HOUSE PHYSICIAN (A), to become vacant on the 1st March, 1942. The appointment is for a period of six months, with salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned. The successful candidate must be a member of a Medical Defence Society.

T. H.G. GARTLAND, Superintendent and Secretary.

The Lawn, Lincoln.

(Registered Hospital for Mental and Nervous Diseases.)

Applications are invited from registered medical practitioners for an ASSISTANT MEDICAL OFFICER (B2), one with previous mental hospital experience preferred. R practitioners who now hold A posts may apply when appointment will be limited to six months.

Electric Convulsion Therapy is in use. Salary £300 per annum, with emoluments and war bonus.

Apply, THE CHAIRMAN OF GOVERNORS, The Lawn, Lincoln.

Glasgow Royal Infirmary.

RESIDENT MEDICAL OFFICER (B1) required at CANNIESBURN AUXILIARY HOSPITAL.

Salary £200 per annum, with board, lodging, and laundry.

Applicants with previous hospital resident experience preferred.

Particulars as to duties, &c., may be obtained from the Superintendent, Glasgow Royal Infirmary, 84, Castle-street, Glasgow, C.4.

Candidates are requested to lodge with the undersigned not later than 27th February, 1942, fifteen copies of application and three relative testimonials with each. No canvassing, either directly or indirectly.

Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply, but they must have obtained the sanction of the S.C.M.W.C. to their application.

R. MORRISON SMITH, C.A., F.H.O.A.,
Secretary and Cashier.

Glasgow Royal Infirmary.
Office : 135, Buchanan-street, Glasgow, C.1.

City of Salford.

PUBLIC HEALTH DEPARTMENT.

SENIOR CLINICAL TUBERCULOSIS OFFICER.

Applications are invited for the above-mentioned permanent appointment, the salary for which will be at the rate of £750, rising by biennial increments of £50 to £937 10s. per annum, plus a temporary cost-of-living bonus which at present amounts to £24 per annum. The post will become vacant on 15th June, 1942, and is subject to the provisions of the Local Government Superannuation Act, 1937.

Form of application and particulars of appointment may be obtained from the Medical Officer of Health, 143, Regent-road, Salford, 5, by whom applications, accompanied by copies of not more than three recent testimonials, must be received not later than 28th February, 1942. H. H. TOMSON, Town Clerk.

Newark General Hospital.

(66 Normal Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of JUNIOR HOUSE SURGEON (A), now vacant. R practitioners within three months of qualification may apply. The appointment is for a period of six months. Salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, sex, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

B. C. DION, Secretary-Superintendent.

Thoroughly Experienced Dispenser-Secretary,

excellent references, seeks post as DISPENSER-SECRETARY or SECRETARY only. Typing, book-keeping, linguist. Preferably in or near London.—Miss COHN, Pembroke House, Fountain-lane, Soham, Ely, Cambs.

Capable Lady Accountant seeks part-time work.

—HIGGS, 34, Cartwright-gardens, W.C.1. Messages: EUSton 1944.

Female Assistant for duration. Country

District, Nottinghamshire, reception area. State particulars.—CRIPWELL & JOHNSON, Accountants, West Gate, Mansfield.

Doctor has Vacancy in his well-

appointed home. Rest Cures, Convalescents, &c.—Address, No. 844, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

For Sale, Western Electric Audiometer.

Model 2A. Complete with air and bone conduction and masking attachment. These instruments are unobtainable at the present time. Price complete, £130.—J. A. PRISLEY, 27, Byrom-street, St. John-street, Manchester.

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COD LIVER OIL with MALT EXTRACT

There's FOOD as well as vitamins in 'Kepler'

The dietary value of cod liver oil has long been recognised by the medical profession. No other natural food presents Vitamins A and D in quantities so admirably suited to the dietary requirement.

Blended with high-grade extract of malt, as in 'Kepler' Cod Liver Oil with Malt Extract, it provides the answer to many nutritional problems of the present day.

This pleasantly flavoured and easily digested preparation forms an ideal dietary supplement for young and old, guarding them against a possible dietary deficiency in Vitamins A and D and supplying in addition a source of readily assimilable fat and carbohydrate.

Bottles of two sizes, 2/3 and 4/- each.

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